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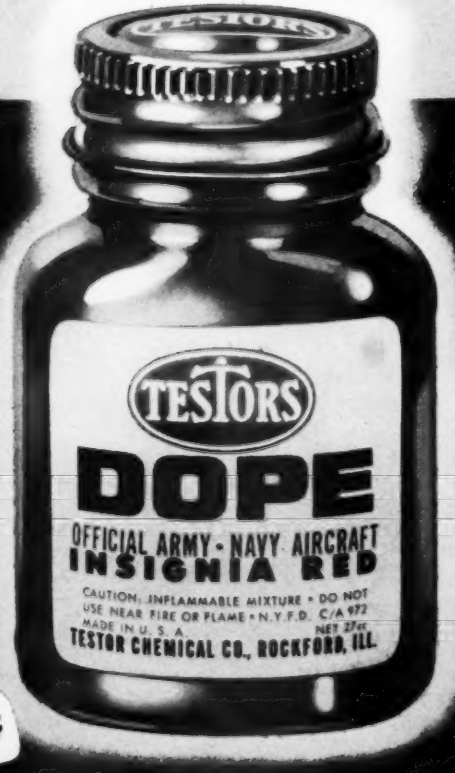

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FEBRUARY, 1951 VOL. XLIV—NO. 2

CONTENTS

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THE other night the Scrap Box attended a meeting of a well-known Eastern club and heard the tail end of a previous week's debate over proposed rules' changes. *AMA* headquarters had sent out a last minute bulletin asking for reaction to a long series of rules' changes suggestions. It was unfortunate that a slim margin of time had been allowed for people to return their answers. This seemed to be interpreted by the boys as "railroading" of rules desired by some sinister Dracula for some mysterious foul motive. How panicky can we get?

The Scrap Box stands squarely in the middle on the *AMA* question. The *AMA* has been reported on objectively in a recent column. This does not mean that the *AMA* shall go undefended. This rules argument is as good a starting point as any. In years gone by the cry was that rules were imposed dictatorially, that there was no democratic action. That was a half truth for, in those days, a small group had to dream up rules or there would have been no rules. We came of age as a national group when growing individual demands were welded together, and committees, whose members came from all parts of the country, could be formed. Now democratic action has reached the other extreme. Anybody can make a rules suggestion and we suspect the extra bulletin was for the purpose of narrowing down the things we ourselves have suggested to the point where it becomes possible to vote on them. We have our way; we make ourselves heard from every state in the union, then turn on headquarters as trying to "railroad" a lot of phoney rules' changes. The probable cure is to put an end to suggestions from unaffiliated individuals.

"Such letters of criticism are quite often written in haste by dissatisfied *Academy* members and I know they help keep the *Academy* on its toes," Bill Effinger, old time modeler, and proprietor of *Berkeley Models*, recently told Russ Johnson, spokesman of the California group that threatens secession. "However, I am in support of the present administration . . . for the funds that are available to them, they are doing a worthwhile job for the members. If nothing else, we must credit them with helping to establish the *International Meet* with the *Chrysler Corporation* and the *PAA-Load* event with *Pan American Airways*. Both of these deals required a considerable amount of 'behind the scene' effort . . .

"Being in business today I realize the high cost of operation of such an organization, probably more than the member who writes a letter that does not get answered," Effinger goes on. "We feel . . . the dues are entirely too low to give good service.

"It is foolish to try to get model builders to pay more dues, so the best thing we can all do is to get large corporations like *Plymouth* to make sizable donations to keep the *Academy* going . . . the cost of writing only one letter probably costs the amount received by the *Academy* for a year from a member . . . it is easy to find fault but quite hard to set up an organization that will do better for the members than the *Academy* has done in the past.

"Regarding the *Wakefield* contest . . . quite a few of the local leaders . . . are of the opinion that the present *Wakefield* contest is out of date and uninteresting to the vast majority of the present day builders, that it does not warrant all the attention and expense that it is currently given by the *Academy* . . . feel that an equivalent of the *Wakefield* event should be established for Half-A free flight since there is so much more interest in this type of event."

For extending his neck in the interest of fair play, Effinger deserves a vote of thanks. More of the facts are needed if a sad mistake is to be avoided. Take this Wakefield thing. The fact that we don't have a sponsor willing to hand out the dollars without asking questions is assumed by many to be certain evidence that Headquarters is incapable. But the corresponding fact that at least one shocked sponsor wanted to know why the figure was so much higher than he assumed necessary is not mentioned. The answer was that the Wakefield team members are men with responsibilities and that their salaries had to be paid while they were away! The Scrap Box would like to see some of the critics put up or shut up. Anyone can ask for money.

We have got to keep our national organization immune to pressure that holds out promise but always with the word *provided* in the fine print. We must act as the national group we are. If changes must be made, they should be accomplished by true democratic action. That constitution that has so often been discussed, that has been kicked about from committee to committee and which, even now, is further away from being reported out (the committee has collapsed) than ever, is the weapon that should be forged.

Some of the people who, in the past, made threats either stacked the cards against headquarters or actively engaged in sharp politics. There are too many known cases of folks greeting themselves as they meet coming and going. After one of our largest contests, the CD neglected to forward applications for records made at the meet. This compelled headquarters to spend months unraveling a situation which could, and did, create much hard feeling. The Scrap Box holds no brief for the *AMA-NAA* set-up but our democratic action begins to sound like a mob. Secede? Let's take the gun out of our mouths!

Defenders of the status-quo of the Wakefield contest—we had suggested modernizing it with Half-A gas engines—prove surprisingly few but enthusiastic. "Dear Benedict Arnold," began Francis Ross, *The Hobby Center*, Laurel, Miss., Bob Hatschek, president of the *Prop Spinners*, got excited to the point of incoherency, he thought; Don Donahue gives a lusty bronx cheer for the whole idea. But of all that we have read from the ardent Wakefield-as-is boys, the most convincing argument was a simple remark by Al Van Wymersch. "Why take away something we love?" Perhaps, as Bill Effinger put it "an *equivalent* of the Wakefield should be established . . ." It might have been better if the suggested A/2 Wakefield had not been suggested as a substitute for the rubber jobs so beloved by the old-timers.

"Now this Wakefield event is certainly not a beginner's event," said Bob Hatschek, "but then why should it be? To me, and many others, this event is the pinnacle of the hobby. It is the summit for which all modelers should strive. It is an event which takes model development to the utmost. Practically all Wakefield models are good models; one never sees Wakefields as sad

(*Turn to page 7*)

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Wee Willie 18" AA-A	1.95
Whirlaway 11" AB	3.95
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Ohlsson AA	.75	—
Ohlsson #2 or #4 Econ.	.59	—
Powermist Glo	.95	—
Powermist Spitfire		1.55
Ranger Glo	.80	—
Red Devil	.60	1.10
Testors 39	.75	—
Dynaglo	.75	—
Ranger AA	.80	—
Spitfire AA	.80	—
Blue Blazer #1	.65	—
Blue Blazer #2	.75	—
OK Cub	.75	—
For Diesel		
Dyne	—	1.00
Ranger (Fixed Head)	1.00	—
Ranger (variable head)	.85	—

Pouring Spout For pint cans ... .10
Hot Fuel Proofer ... .25, .35 & .45

PROPELLERS

Rite Pitch Stunt 8, 9, 10, 11, 12, 13, 14 in., 6 and 8 pitch ... .35
Rite Pitch 8, 9, 10, 11, 12, 13, 14 in., 6, 8, 10 or 12 pitch ... .35
Scamper Plastic 5½" 8p. .25; 9" 6p .45; 10" 10p, 11" 8p .65
Super Spl. 8", 9", 10", 11" in 6 & 8" p. ... .25
Veco 6" 3p, 4p, 7" 4p, 5p, 8" 5p, 6p, 9" 6p, 7p (6"—25¢; 7" & 8"—30¢; 9" & 10"—35¢)
Also Ohlsson, Flo-Torque, Garday

RUNNING & TEST BLOCKS

E-Z Running Stand ... 1.25
Universal Running Blocks ... 1.00
Wright Test Block (Ign.) ... 4.95
Wright Test Block (Glo) ... 2.50

METAL GAS TANKS

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#1—1½x1¼x⅝ #4—⅞x1¼x¾
#2—2⅛x1¼x⅝ #6—1½x1⅞x1
#3—2½x1⅞x1 #12—¾x1x¾
#15—2¼x1⅛x⅝
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1¼x1¾x2 Sq. ... .80
1¾x ⅝x2¾ Wedge ... .80
1¼x1x2¾ ½-Rnd Stunt .80

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Aero Qual. ..3.00 Regular ... 1.50
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O.K. Twin ..3.50 Winston ... 2.00
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Arden AA ... .49
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Champion V, V2, V3, VR1, VR2 .50
Infant Glo-plug ... (tpl) ... .65
McCoy Hot Point ... .65
Ohlsson Glo (V, V2 or AA) ... .65
O.K. Glo-plug (V2 or V3) ... .49
Plug washers ... .05

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Arden Booster Jack ... 1.25
Austin Booster Plug-in ... .30
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Ohlsson Snap-Pack ... .35
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1½"-85¢; 1¾"-90¢; 2"-.95; 2½"-1.00
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2" ... 1.20
Plastic 1½" ... .50
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2½" — 1.10, 3" ... 1.50
Sparky Tail Wheel Assembly .. .25
Sponge Rubber, Dural hub (pr) ⅞"—25¢, 1 1⅛" 28¢; 1¼", 1⅜" .35, 1⅞"—50¢, 2¼" ... .65
Sponge Rubber, Wood Hub (pr) 2"—40¢, 2½"—50¢, 3⅛" ... .60
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1¾", 2"—50¢; 2¼", 2½"—60¢; 2¾" ... 1.00
3"—1.25; 3½"—1.50; 4½" .. 1.75

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Stutter-off Valve ... .75

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.006 x 2—52' ... .50
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Presto Starter (state engine) ... .18
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Copper Tubing ⅛" OD, per ft. .20
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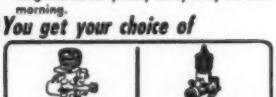

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(*Continued from page 2*)

as some of the gassies that litter every field. Please, let's keep the Wakefield as a peak of attainment." This Hatschek fellow really packs in the turns. Shall we let him unwind? OK!

"I for one am getting tired of all the pampering that today's youngsters are getting. They won't even come out on the field on a Sunday unless someone drives them out. I used to take a long bus ride and then walk three miles to Creedmore. I've gone to contests in four different states by public conveyances ranging from trolleys to ferries. My parents tolerated the hobby but did not help me. I competed against men of all ages with models I built myself. There was no such thing as extensive prefabrication. Nor did we need the 'builder of model' rule. Today it cannot be enforced. Papa builds, adjusts, runs the engine, and junior throws the darned thing and hopes. This does not apply to all youngsters but too darn many junior events are won in just this manner."

Feel better, Bob? Know just how you feel. If you got sidetracked and didn't really defend the Wakefield as you meant to, outside of showing that you love it, we still get the point. Most of the veteran Wakefield men bring up all these things, as well as Plymouth's freezing out of the open age group. Maybe fellows like yourself are concerned that, having found something worthwhile in modeling, a tendency to bow to youth with all manner of blandishments threatens to sink the things you hold dear. Francis Ross sounds the same way.

"The Wakefield event should be preserved intact forever," Francis begins. "The fact that 'old men' love it is not a reason to eliminate it, or even change it, and just let anyone try to alter that. 'Old men' also love their wives and children. 'Old men' also love microfilm but don't erase that just because people don't appreciate it." Francis, you expressed beautifully the whole argument. Both sides of it!

"Make Wakefield the only *rubber* class," Ross continues. "With so many thousands building and experimenting with one class, certainly a few will emerge as superior. Limit free flight gas to .099. Now let someone else fall unconscious! Divide that into A, B, C, down to .02's, then start the same old arguments about wing loadings, power loading and so on."

There is no reason why the only outdoor rubber event should not be Wakefield. If Stick stands, then let the Wakefield be the Fuselage. Right now, the Wakefield event is considered an extra and is run on the same basis. It's a kind of country cousin. If we want better ships, if we want the U.S. to win more often, there would be no better medicine than making Wakefield the standard fuse event. One thing that bothers us is the general unwillingness to dispose of some of the gimcracks that have been gathering dust in the attic for years. Events are added but never taken away. If the current generation of leaders and rules' makers had stumbled on the scene just a few years earlier, we still would have a twin-pusher event. Ross may sound wild on that .099 gas business but who can guess the future? D is gone, thank goodness. C should go. No one would mourn it. Why not let B and C compete together as they will in Payload this year? There is no need for anything bigger than a .199 job today.

"Add another scream of anguish to your growing list of screamers," says Fred Taylor, Clearfield, Utah. "Why do you, a recognized leader in American model building, take it upon yourself to surrender the Wakefield event. Traditionally, this country does not quit when the going gets tough. Why advocate that we quit now. If Ellila has done so well, it is up to us to do better, not to try to get out of the competition or to change the event to make it easier for us."

Fred, you have us wrong. It was our feeling that a gas-engine event (let's say in addition to rubber, ok?) with Wakefield type rules on an international basis would be a true boost to aeronautical youth in any land. The overwhelming bulk of modelers are not interested in personally participating in the Wakefield. They know better. Just as they know better about trying to beat Grish, deBolt, Mahieu, etc. in speed. Perhaps the experts could set the example, teach the kids how to handle rubber, making folding props, adjust. But they do not. Aren't the kids interested? In this column it has been urged repeatedly that, as Francis Ross also just suggested, our rubber events be standardized with Wakefield models. If the old fellows who love Wakefield so dearly want to see it over the top they have got to popularize it effectively. The average kid coming up today thinks you have holes in the head if you try to get him to settle for rubber rather than a *Cub*, *Wasp*, etc. Soon he will be the so-called old man. What then?

"Your idea of installing engines in Wakefield models is a joke," challenges Don Donahue. "Did you stop to think how light wing loading now is. Fellows here now use 200-300 sq. in. to control certain A/2 engines. They climb like mad." We don't buy that, Don. The *Veco Sioux* has about 180 sq. in. and there is no problem whatsoever to handling it with an .049. An eight ounce Wakefield is not a floater. One top A/2 payload in the east has just over 200 sq. in. Maybe those knife thin wings are doing it. You can't have everything.

"Your point about Wakefield for the old men is well taken and very true," Don goes on. "I don't think it fair to ask a junior to start with 200 sq. in. in models; rubber costs too much, building time is too long, tools to bend 1/16 wire and know-how too much. To win now, a kid must have a good big model, as some other kid who, 100 to 1 did not make his own model, will enter and win."

(*Turn to page 45*)

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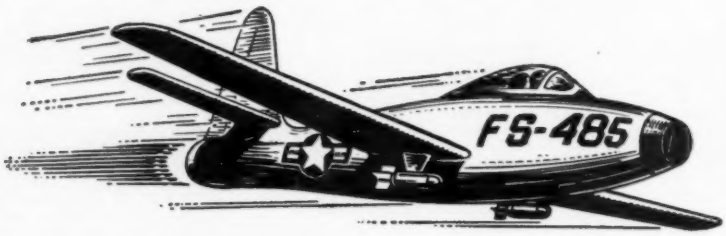

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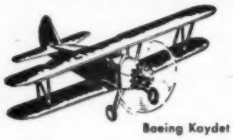
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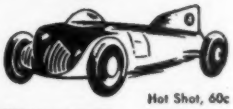
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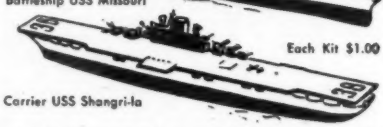
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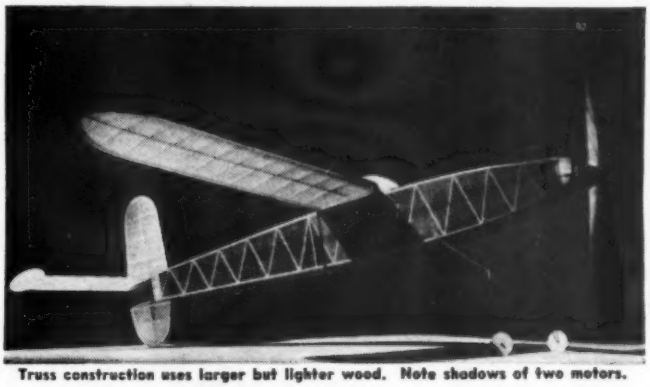
The author releases the winning model for a first flight of 3:58 min. The total time was better than 12 min., the average time 4:06.

The 1950 Wakefield Winner

by Aarne Ellila



Truss construction uses larger but lighter wood. Note shadows of two motors.

Impossible they said, but here it is, a 4:30 min. design

DUE to my victory in 1949 in England, distant Finland got the opportunity to arrange the Wakefield Cup Contest in 1950. The event has been held and the host country was lucky enough to see her son win the contest again. The climatic circumstances were such that there could not be any argument that the weather would favor some competitors more than others. The conditions were the same for everybody. The quality of the results is the best proof of it. How then did my model win the contest?

My plane is a direct development of the one which won the Wakefield Cup Contest in 1949. The main measurements are the same, the length of the fuselage being exactly equal. The wing is 2 c. (.787") longer. The airscrew is larger, but the fin has lost some area. The amount of rubber is still the same.

After I received the necessary quantity of balsa in April from England, I began to build my model. The plans had been made in the early fall. According to my calculation, the model should have been capable of 4 to 5 min. in flight. It had been planned for a tensioned motor, and the weight without the rubber ought to have been about 100 grammes (3.52 oz.). When the plane was ready, the scale showed a weight of only 92 grammes (3.24 oz.).

The first flights were not promising. The glide was difficult to trim and, therefore, I was rather uneasy, this being the middle of June. One good thing: during the motor run, the plane was well-behaved. If only I could get the glide in order, everything would be all right. I made experiments with a small turbulator strip on the leading edge of the wing. The effect could be noticed at once. The glide, before so difficult to trim, became steady and I could move the wing 1.5 c. (.59") forward. Now I was able to start testing with more turns.

New difficulties arose now. The 180 c. (70.87") long rubber did not work very well. The fuselage seemed to be too constricted at the rear and there gathered some knots, which changed the center of gravity. Besides, I could not get the rubber to turn steadily and the model had a tendency to tremble so much that I was scared it would break to pieces in the air. With only three more weeks 'til the contest, something had to be done quickly. I made up my mind to build a new fuselage for two motors; consequently, I wanted to use *crocs* or gears, as in my 1949 model.

The new fuselage was ready in a few days. It was built in such a manner that I was able to use all the other parts. Therefore, there are some points in the plane, which would have been built in a different fashion if it would have been planned for gears from the first. The new fuselage was a bit heavier than the previous one, as it had to be stronger. In addition to the weight of the frame, there were now the gears and the extra nose-hook, so the weight loaded after alteration was 110 grammes (3.88 oz.).

After the rebuilding I thought I could be sure of my model, and this proved true. The ship was gliding steadily, but there was still plenty of trimming to add. I had a big job with the incidence angles, and I have to admit that before the event began I still was not satisfied with the trim. There was much to be done with it, and, therefore, the final results could have been better.

The evening before the contest I tested my model the first time with full power. The take-off was not successful, and, due to my mistake the airscrew broke. I was not able to fly any more that evening—as happened just the year before. When I went to the starting place for making my first flight, I did not know what would happen. I know it is irresponsible to enter any contest so poorly prepared, but the run of bad luck in small matters had to be blamed. I had worked hard. The bad luck would have to change, and I had to trust to that.

I felt high strung, as I prepared for the start. I wound to the maximum and looked at the model to see if everything was in order; then released the plane. The start was not bad and, as the model reached the height of 20 m. (66.5′), it made smaller circles, the nose beginning to sink slant-wise toward the earth. I thought the contest was done for me, but as the model made an entire circle in this dangerous position, it began to climb higher. There was nothing to complain about after that. To my big surprise this flight was the best of Round 1, although the model disappeared out of sight of the timekeepers behind the trees.

After it was returned, I altered the trim and changed the motors, then waited for the next round. I was not so afraid. The worst was over with! There was not anything wrong with the second flight, which was the best time of the contest *4:31.5*. I consider this time normal for a performance of this design in smoother air.

I did not change the motors for the third round. Due to this fact, and because the plane landed in the forest far away, the time was not so good. If my model would have been in the best possible order from the very beginning, the final time would have been better. I was quite surprised anyway about my victory, and particularly about the big difference in the times between the winning model and the one which had the second best time. When I learned before the contest what times the others had gotten in the trials, I guessed the average time of the winner would be about 4:30 min. This shows it is not easy to compare such results when they are attained under different circumstances. On the basis of experience gained at this event, I suppose, if I had taken part with my last year's model, the competition between Evans, Leardi and myself would have turned out to be most equal and exciting.

As mentioned above, the airplane which won has been directly developed from the model I had the year before. The drawing shows the structure and thickness of the material; the strips are thick, which is due to the fact that the material all over is white and soft balsa. By building a model from soft and white balsa and using thick strips, we get the construction stiffer, better, and lighter than when using hard balsa. It is a slabsider of somewhat smaller dimensions than the previous year's and larger dimensions than the average Wakefield design. The characteristics are a long fuselage, high aspect ratio wings, central fin, a high aspect ratio stabilizer with end plates and the double motor of 14 strands of 1/4" x 1/24" *Dunlop* rubber with transfer gears at the back.

The fuselage is constructed from 5 mm. sq. (about 1/5") balsa longerons with spacing struts 2.5 mm. sq. (about 1/10"). The sides have been built up by using the diagonal structure, so that the fuselage could keep its form but not for getting it inflexible; then the upper and bottom parts are not stiff. The stiffness of the fuselage has been principally gotten by a double covering on the upper and lower parts. Compared with the previous model, the height of the fuselage has been decreased; this lost cross section of the fuselage has been compensated for by a bump at the wing.

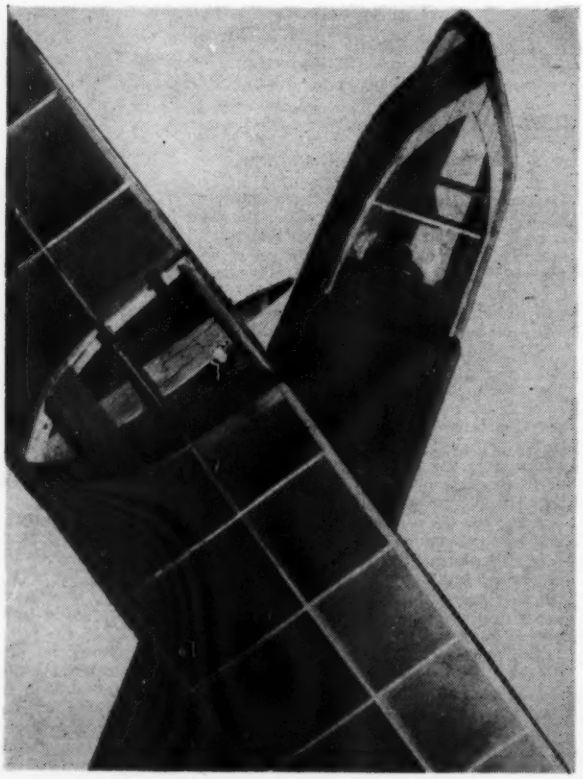
The wing is held in place on the fuselage with rubber strips 1/24" x 1/4" which go around the fuselage and cross over the wing under the bump. The lower part of the fin is firmly fastened to the fuselage. In the rear portion of the fuselage is a notch for the stabilizer which is held in position with rubber bands engaging hooks in the usual manner. This kind of fitting I found most successful, as the stabilizer and the rudder stay absolutely in the position required by trimming, but not too stiffly fastened; there is, therefore, no danger of breaking them.

In the nose the longerons have been made thicker by cementing strips to both sides of them so that they are not weakened when formed to follow the nose block contour. Besides that the nose is reinforced in the usual way with 5 mm. (about 3/16") sheet and afterwards curved to its right form. The front plate is made of 1.2 mm. (about 1/20") ply, the upper side of which is reinforced with 1 mm. (about 1/25") ply to take the second hook.

The landing gear is fastened in orthodox way to the fuselage by using aluminum tubes and rubber bands.

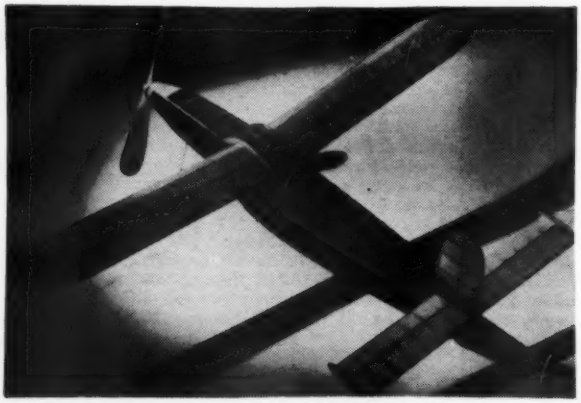
The wing is 2 c. (.787") longer than the previous one and slightly wider. This apparent addition in the area has been possible by using the bump mentioned before. By using a ramp under the center part of the wing, it has been possible to have only one break in the leading edge for the dihedral. However, the trailing edge has two breaks because it lies straight on the fuselage. The ribs are of 1 mm. (about 1/25") balsa and the nose is planked top and bottom with 1/32" balsa sheet to a depth of 27 mm. (about 1-1/16") on the upper side and of 12 mm. (about 7/16") on the lower side from the leading edge. The center part of the wing has been reinforced with a double main spar and with an extra spar which is

(*Continued on page 52*)

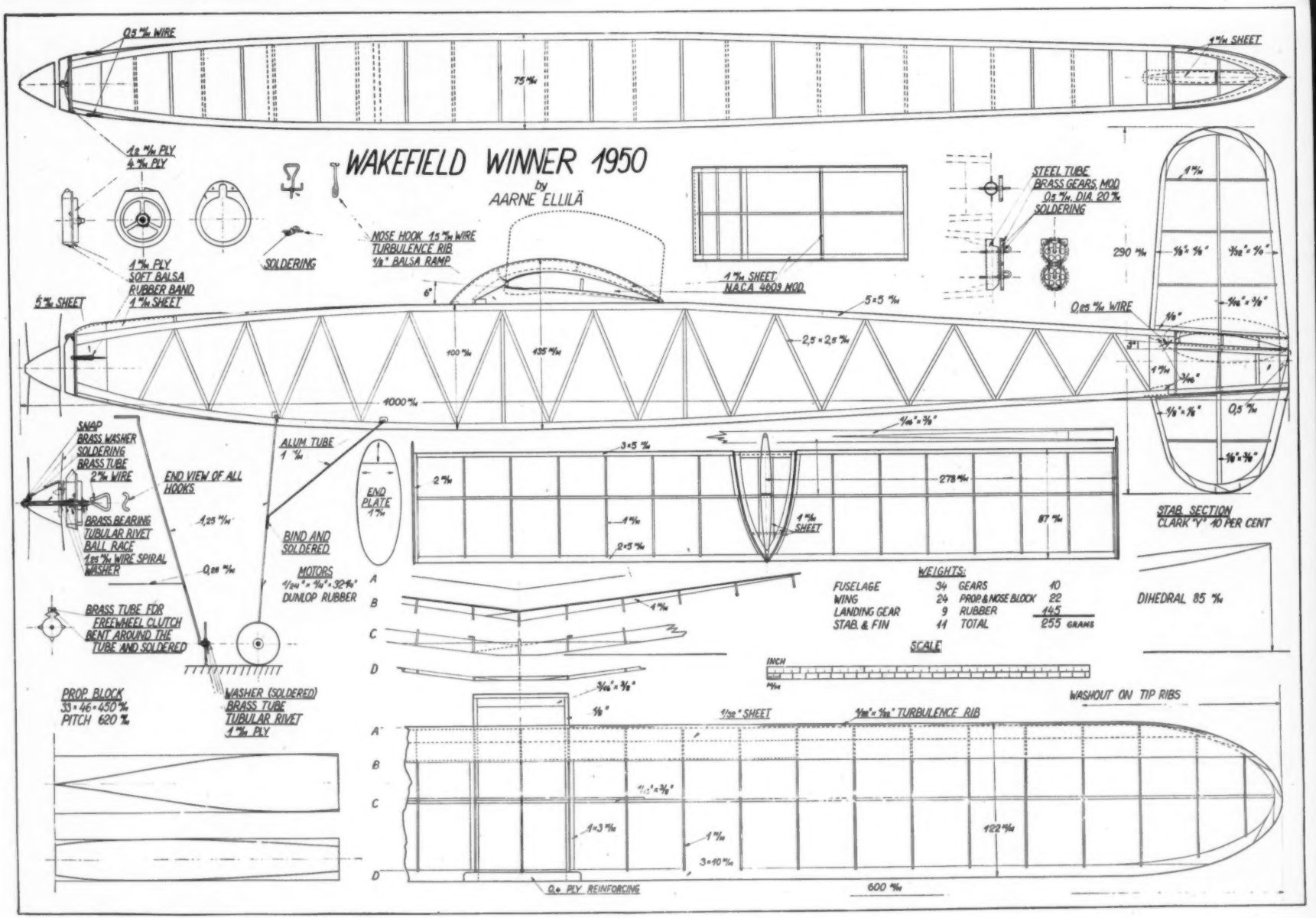


Due to the gear arrangement, the motor run is 2 min. Each motor consists of 14 strands, 1/4" wide black rubber. Motor length is about 32 1/4".

Each motor is wound individually from front; 600 turns each, or 1,200 total. Without motors, this design weighs 3.88 oz. empty. Propeller is a free-wheeler.



When trim difficulties were encountered, the designer added 1/32" sq. turbulator strips to leading edge. Overall design is quite simple, as is seen here.

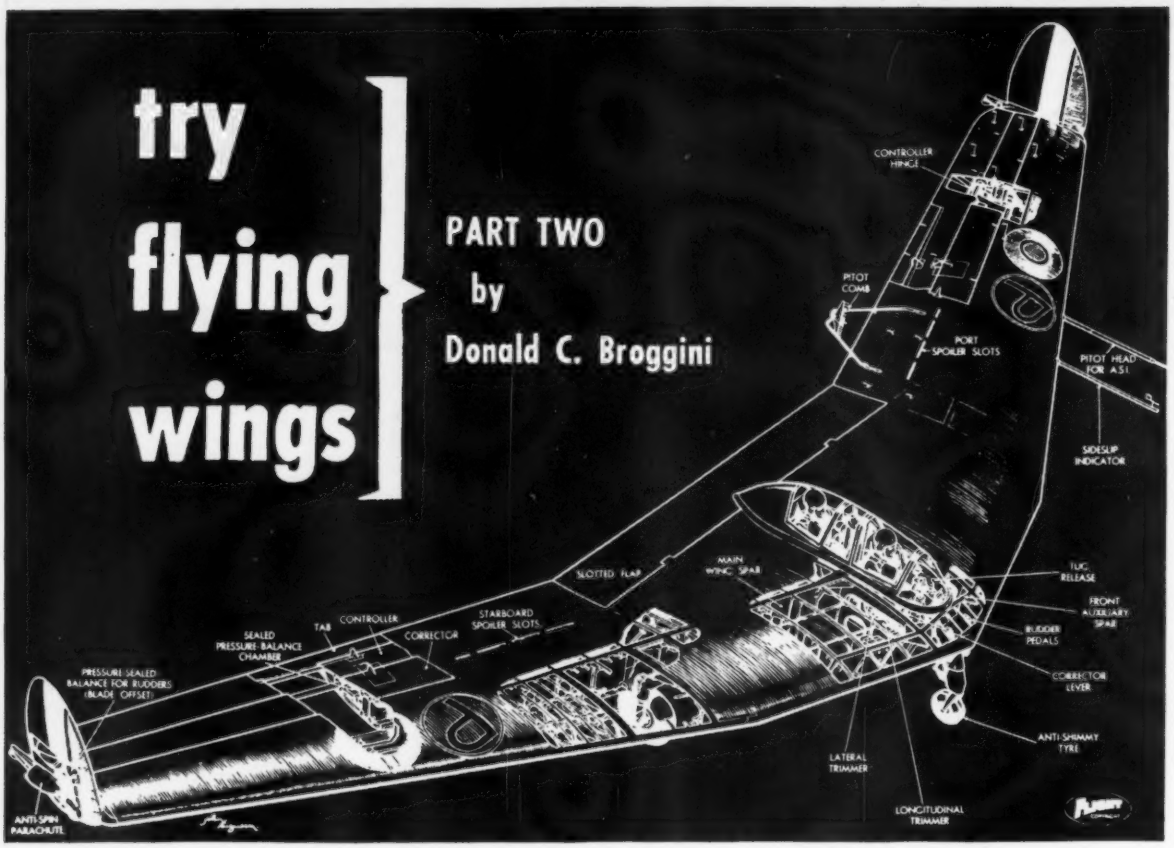

WAKEFIELD WINNER 1950
by
AARNE ELLILÄ
0,5 m/m WIRE
1 m/m SHEET
75 m/m
1,2 m/m PLY
4 m/m PLY
1 m/m PLY
SOFT BALSA
RUBBER BAND
1 m/m SHEET
SOLDERING
NOSE HOOK 1,5 m/m WIRE
TURBULENCE RIB
1/8" BALSA RAMP
1 m/m SHEET
NACA 4609 MOD
STEEL TUBE
BRASS GEARS, MOD
0,5 m/m, DIA 20 m/m
SOLDERING
290 m/m
5 m/m SHEET
6°
100 m/m
135 m/m
5=5 m/m
2,5=2,5 m/m
1000 m/m
0,25 m/m WIRE
3°
SNAP
BRASS WASHER
SOLDERING
BRASS TUBE
2 m/m WIRE
END VIEW OF ALL HOOKS
BRASS BEARING
TUBULAR RIVET
BALL RACE
1,25 m/m WIRE SPIRAL
WASHER
1,25 m/m
0,88 m/m
ALUM TUBE
1 m/m
BIND AND SOLDERED
END PLATE
1 m/m
3=5 m/m
2 m/m
1 m/m
2=5 m/m
1 m/m SHEET
278 m/m
87 m/m
STAB. SECTION
CLARK "Y" 10 PER CENT
MOTORS
1/24" = 1 m/m = 32 m/m
DUNLOP RUBBER
A
B
C
D
1 m/m
BRASS TUBE FOR FREEWHEEL CLUTCH BENT AROUND THE TUBE AND SOLDERED
WEIGHTS:
FUSELAGE 34 GEARS 10
WING 24 PROP & NOSE BLOCK 22
LANDING GEAR 9 RUBBER 145
STAB. & FIN 11 TOTAL 255 GRAMS
DIHEDRAL 85 m/m
SCALE
INCH
m/m
PROP. BLOCK
33 = 46 = 450 m/m
PITCH 620 m/m
WASHER (SOLDERED)
BRASS TUBE
TUBULAR RIVET
1 m/m PLY
WASHOUT ON TIP RIBS
1/32" SHEET
1/32" = 1/32" TURBULENCE RIB
1=3 m/m
1 m/m
3=10 m/m
122 m/m
0,4 PLY REINFORCING
600 m/m

try flying wings

PART TWO

by

Donald C. Broggini



THE location of the Center of Gravity with respect to the Aerodynamic Center is the key to longitudinal stability (stability in pitch). A simple graphical solution will give the Mean Aerodynamic Chord and the A.C. From this the correct location of the C.G. can be determined.

Referring to the drawing, let us take the case of the swept-wing monoplane, plane A. Draw the 50% chord line by marking off half the root chord and half the tip chord and connecting these two points, line A-B. Lay off the tip chord behind the root chord and lay off the root chord in front of the tip chord. Draw a line connecting the end of these two lines, line C-D. Now draw a line through the point where C-D intersects the 50% chord line, and parallel to the center line of the airplane. The intersection of the leading and trailing edges by this line determines the mean aerodynamic chord line, E-F. Mark off 25% of the M.A.C. This point is the theoretical aerodynamic center. The actual A.C. of most airfoils is very close to 25% the chord. Since the left wing is the same as the right wing, the M.A.C. etc., appears, of course, on the center line of the plane.

To obtain a stable wing system longitudinally, there is but one simple rule to follow. *Place the center of gravity in front of the aerodynamic center.* This rule neglects, of course, the influence of the vertical position of the C.G. with regard to the wing which is generally negligible and what influence there is, is a stabilizing one on most designs. The C.G. should be a minimum of 20% the M.A.C. and preferably further forward to result in a craft of ample stability. The further forward the C.G., the more stability, but the less efficiency. If the C.G. is on the A.C., the craft will have neutral or marginal stability. If the C.G. is aft of the A.C., the craft will be unstable.

Now that the correct location of the C.G. of the Flying Wing is known, it is necessary to locate the motor so that the complete airplane will balance at this point. The distance the motor is in front of the Flying Wing's C.G. is found by dividing the weight of the motor by the weight of the wing structure and then multiplying this by the distance between the Flying Wing's C.G. and the C.G. of the wing structure. The term *wing structure* is used to define the airplane less the motor, and the term *Flying Wing* as the complete airplane. The C.G. of the wing structure may be assumed to be at 50% the M.A.C.; however, if there is a wing of your favorite construction handy, its C.G. may readily be checked. For example let us find the location of the motor on plane A if it is to be powered by a 1 oz. .035 cu. in. motor. Under the present rules that would mean that the total craft should weigh 3-1/2 oz. minimum, thus leaving 2-1/2 oz. for the wing structure. With the C.G. of the wing structure at 50% the M.A.C. and the C.G. of the Flying Wing at 20% the M.A.C., the distance between them would therefore be 30% of the M.A.C. The distance the motor is in front of the Flying Wing's C.G. is then 2.5 oz.

——— x 30% = 75%. Now measure off
1 oz.

75% of the M.A.C. and lay off this distance in front of the Flying Wing's C.G. This is the location of the motor. It so happens in this case that the location of the motor proves to be rather inconvenient. With the position of the motor being so far from a convenient location, it would be best to change the planform. Varying the sweepback, the aspect ratio, or the configuration may give the desired results. In the case of the first two, the above graphical solution is merely performed again for the new planform.

For the third case let us take for example, plane B (see drawing). This is similar to plane A but with a center section added. The swept-back outer panel has a chord of 5" tapering to 3" at the tip and a span of 14". Its M.A.C. as illustrated in plane A is located at line E-F. The area of the outer panel is the root chord plus the tip chord divided by two and then multiplied by the span $\left(\frac{5+3}{2} \times 14 = 56 \text{ sq. in.}\right)$ The center section has a semi-span of 7" and a constant chord of 5". Its M.A.C. is 5" and located half way out or at 3-1/2", line H-J. Its area is the span multiplied by the chord 5 x 7 = 35 sq. in. Now draw line H-E and line J-F. Extend line H-J and line E-F. Along the extension of line H-J lay off in any convenient unit of length, the area of the outer panel, line K-L. From point L, draw a horizontal line until it intersects the extension of line E-F, point M. Lay off downward from point M in the same units of length, the area of the inner panel, line M-N. Now connect points K and N. Where lines K-N and L-M intersect, point O construct a vertical line. The intersection of this line with lines H-E and J-F determines the M.A.C. of the wing system line P-Q. If still another panel were added to the wing half, its M.A.C. and area would be combined in a similar manner with the resultant M.A.C., line P-Q, and the total area (56+35) of the first two panels.

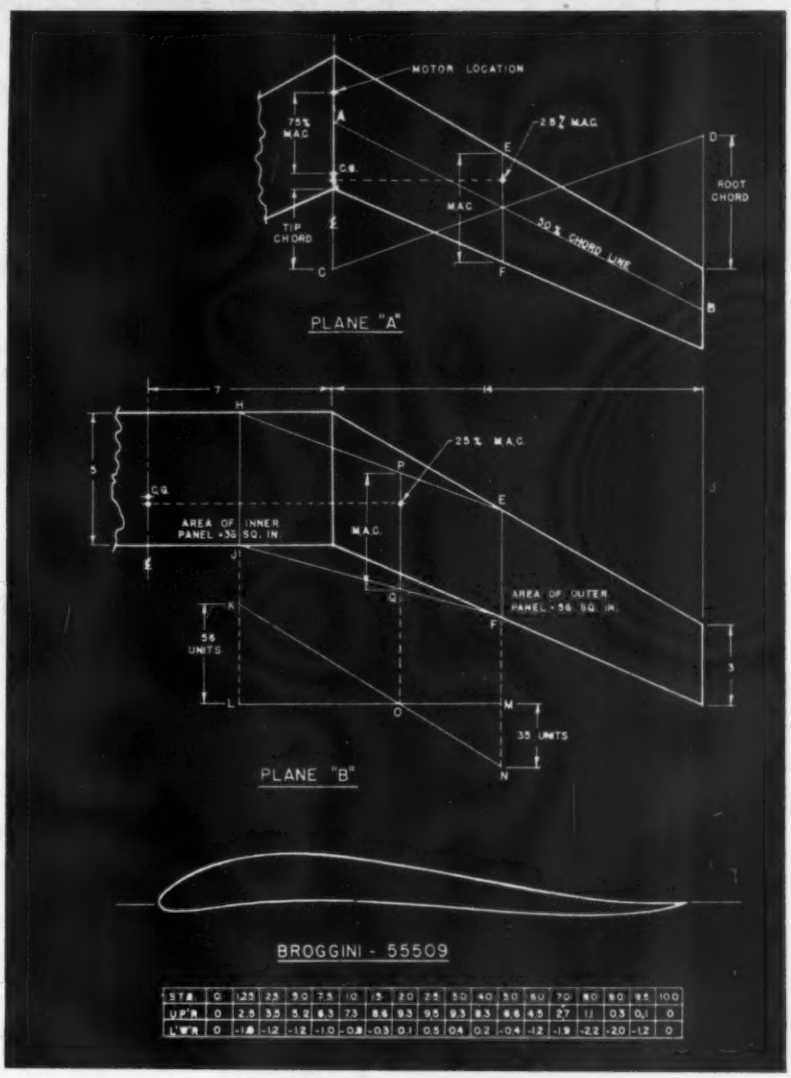
As shown previously, the location of the motor is then determined. In this case, using the same figures as before it will be seen that the motor location is just about at the leading edge of the center section, a much more convenient location than that of plane A. This, like most aerodynamic solutions, does not give an exact answer down to the last fraction of an inch. The process is not exact due to such things as: the variance in the amount of washout that the builder may incorporate; the error in estimating weights; the degree of stability desired; and small variance in the A.C. of the various airfoils. However, the error, if any, may usually be corrected by: changing the amount of washout by steaming the wing and holding it until it resets; by trimming with elevators; trimming with clay; or by relocating the motor.

A few words devoted to airfoils would be well worthwhile. Airfoils may be put in three categories—reflexed, symmetrical, and simply cambered (Clark Y and NACA 6409 are examples of the latter). In general, the reflexed is the stable type of airfoil (as the angle of attack increases the center of lift moves aft thus tending to decrease the angle of attack and vice versa.) And its C.P. (center of pressure), that is the center of lift is at or in front of 25% of the chord. The ideal symmetrical airfoil is of neutral stability with no center of pressure travel. Its C.P. is at 25% of the chord. Actually, however, there is a small amount of C.P. travel tending to make the section slightly unstable. In general the simply cambered airfoil has its C.P. at or behind 25% of the chord and is unstable. (As the angle of attack increases the C.P. moves forward and vice versa, thus tending to aggravate the condition. With a wing-tail system the tail makes up for this instability by its increase of lift as the angle of attack increases thus tending to nose down the craft.) If this type of airfoil is used upside down it is stable but the lift is poor. Although it is possible to make a stable wing system by properly combining unstable airfoils, it is recommended that the modeler stick to the stable and neutral types of airfoils, at least for the beginning.

The airfoil shown, the Broggini-55509, was developed specifically for model planes and has proved very successful. Although the existing reflexed sections that were tried proved entirely satisfactory, their lift was not exceptional due to the fact that their mean line had only 2% camber. This section was developed by selecting a mean line with ample camber for good lift and reflex for stability. The symmetrical NACA 0009 with its maximum thickness point moved forward was then placed around this mean line. The number of this airfoil, 55509, is coded. The first 5 indicates that the maximum camber of the mean line is 5% of the chord, the second 5 means that the point of maximum camber of the mean line is at half of the indicated value in percent of the chord, i.e. 25%. The third 5 means the maximum thickness is at 25% of the chord again 1/2 the indicated value, and the 09 means that the thickness is 9% of the chord. The NACA report on related airfoils having the maximum camber unusually far forward shows the gain in lift on a reflexed section when the maximum camber point is moved forward, up to a certain extent, of course.

It will prove most practical to combine section stability with stability by way of wing shape. One method is sweepback and washout (less incidence at wing tips than the root). A small amount of wash-

(*Turn to page* 52)



STA.	0	1.25	2.5	5.0	7.5	10	15	20	25	30	40	50	60	70	80	90	95	100
UP'R	0	2.5	3.5	5.2	6.3	7.3	8.6	9.3	9.5	9.3	8.3	6.6	4.5	2.7	1.1	0.3	0.1	0
L'WR	0	-1.8	-1.2	-1.2	-1.0	-0.8	-0.3	0.1	0.5	0.4	0.2	-0.4	-1.2	-1.9	-2.2	-2.0	-1.2	0

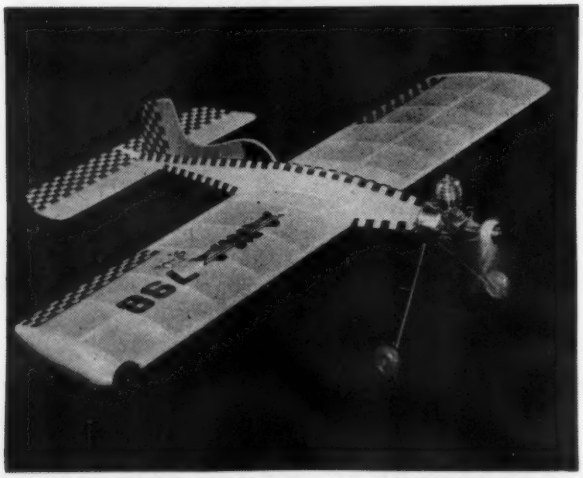
Opposite page—Tie-in between models and full scale often is remarkably close. Below—Don with successful flying wing entered in many contests; sometimes brought home the bacon. Best proof of its potency is the chute type dethermalizer. Specifications the result of long research program.

caper cutter

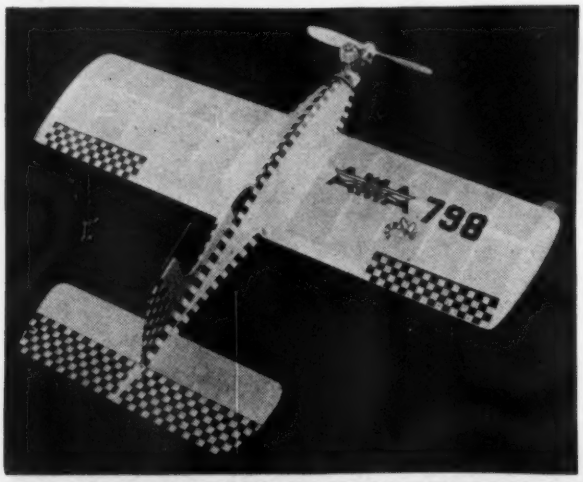
by TED GRZESZCZAK

Detachable landing gear permits take-offs or hand launching as the builder desires. Shown with a Wasp, takes Cubs, K & B's, Andersons.

Junior, pop, grandpa will have the time of their lives with this simple stunter. Easily scaled up



Not a profile, not a box, diamond fuselage gives maximum strength with minimum weight. Large face drag bushing on outside tip acts like offset rudder.



What could be cuter? Nifty checkers are decals by *Trim Film*. Propeller shown is standard colored plastic. External pushrod makes for easier adjustment.

WITH all the furor about baby-engined free flight, too many modelers are overlooking the possibilities of another swell deal, the small engine stunt job. Perhaps it is because of the mistaken idea that a stunt model has to be a flying barn door. With such miniature powerhouses as the new *Atwood Wasp*, *Cub .049* and *.074*, the *K & B .049*, and the *Spitfire .045*, it is entirely possible to make a stunter that will do the pattern and duplicate anything a big job can do. The *Caper Cutter* is a flip-flopping fool.

The *Caper Cutter* is designed for competition in a variety of sizes. Full-size plans on the next two pages make it a cinch for anyone, beginner or expert, to duplicate the original. The two-view drawing provides all necessary data for the more adept to make the larger versions. While stunting little ships is fun at low cost, the ideal stunter, of course, is powered mostly by .29's, .32's, .35's, etc., with a hot .19 being the lower limit.

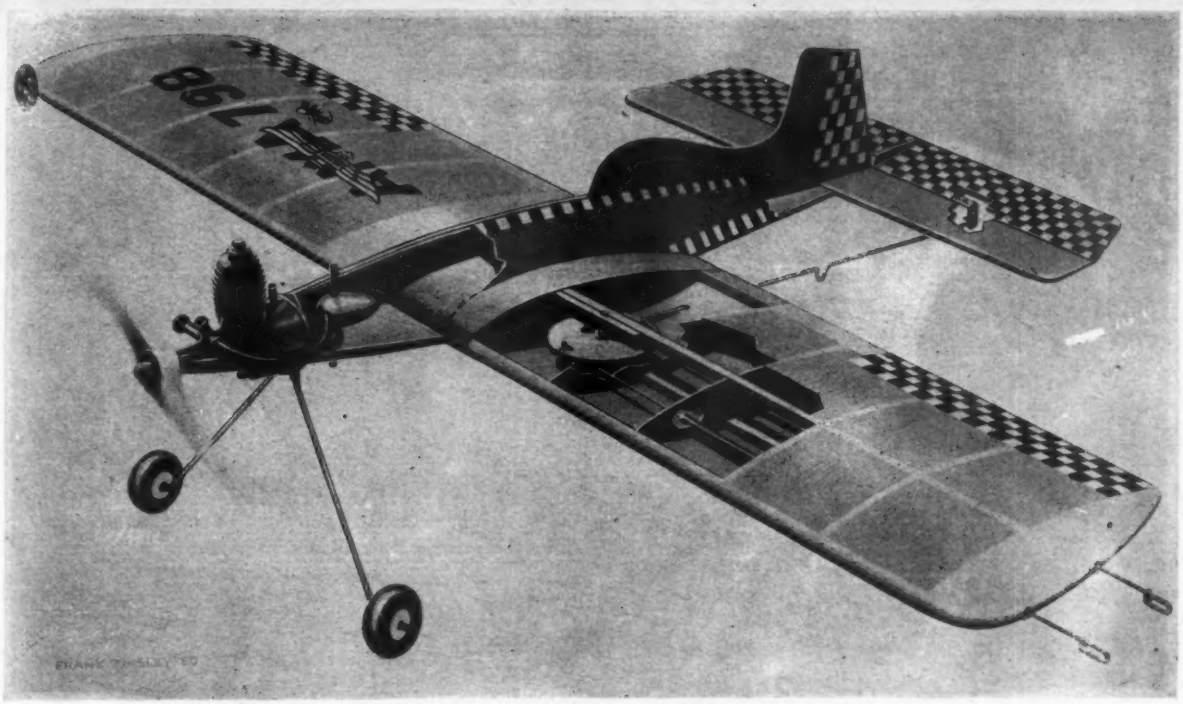
Many good design features have proved out in this ship. The more or less standard things may be taken for granted, such as symmetrical airfoil, large area, short tail moment arm, large elevator area. It goes beyond that. The most significant feature is the fuselage which involves an X backbone, diamond cross section, and sheeted sides. This sounds a bit complicated but actually is as simple to build as any other fuselage. It is tremendously strong and will reduce chances of a snapped fuselage in a steep high-speed crash. Moreover, the fuselage acts as a jig for assembling the wing, complete with bellcrank assembly, into one virtually indestructible unit.

To make the fuselage, a vertical keel is cut from 1/8" fairly soft balsa. The wing opening is cut out—see wing section on the side view. The wing slides into place and then the horizontal keel pieces of 1/16" sheet are cemented in place. Use a triangle or square to insure accuracy. The *Maeco* tank (4 cc. profile) fits against the side of the vertical keel as shown on the plan. (A wedge tank may be substituted.) To complete the body, cement in place opposite sides of 1/16" sheet (see detail); then, when dry and trimmed, add the other two sides and trim them, too. The cockpit and fin are cut to outline from 3/32" sheet and cemented on the top corner of the fuselage.

The wing consists of the usual leading and trailing edges and two 3/16" sq. spars. The center section is sheeted over with 1/16" sheet balsa which means that the 1/8" thick center rib, and 2 adjacent 1/16" ribs have an outline 1/16" less on top, and bottom than the remaining ribs. The leading edge is cut from the spar strip material, and the trailing edge is sanded down and shaped from a medium hard piece of 1/4" x 1/2". The tips are soft blocks. Probably the easiest way to make the wing is to assemble the center rib and the tip ribs on the top and bottom spars, lining them up with your triangle, then fastening on the two edges. Finally, the other ribs can be worked into position and cemented.

The bellcrank is nothing more than a plywood wheel with holes drilled for the rod, pivot, and lead-outs. (See top view of wing.) It fits between the spars. Any light metal bellcrank may be used. Note that two lengths of 1/16" outside diameter tubing carry the leads through the tip and outer ribs. The stabilizer and elevator are cut from fairly hard 3/32" sheet balsa. Use any standard elevator horn but do not position your pushrod too close to the elevator which gives added movement and excessive control. It is better to have more movement of the hand, with less response from the ship, than excessive response with very small hand movements. That is, if you want to fly safely and easily.

The pushrod is 1/16" music wire; it is heavy to prevent buckling under loads when flying. The kink is for adjusting purposes. Very often the attachment of the rod ends up with slight up or down on the flipper. This can be compensated for



Unique keel construction, diamond cross section; tank, and bellcrank installation show clearly in cutaway drawing.

by opening up or closing up the V-shaped kink with a pair of pliers.

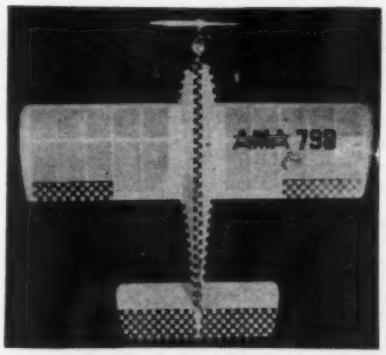
The landing gear is optional. A special detail shows how to make a drop-out gear. If the ground is smooth, take-offs are fun. But, without gear, the *Caper Cutter* can be flown just about anywhere. Lots of folks prefer the simpler hand launch. Covering is of *Silkspan* or *Skysail*. On the original, white paper was used and then dyed yellow. Trim was done with *Trim Film*.

Flying is a matter of proper trim. A 1/2 oz. piece of lead inserted in the outside wing insures against the ship coming in when the lines slacken slightly, or against coming down when the plane is overhead. A large face eyelet cemented to the leading edge of the outside tip accomplishes the same thing as offset rudder. However, you may prefer to offset your rudder toward the outside of the circle. No offset to the outside was used in the engine but if you want, a washer may be slipped over the mounting bolt on the inside of the circle, which points the shaft slightly outward.

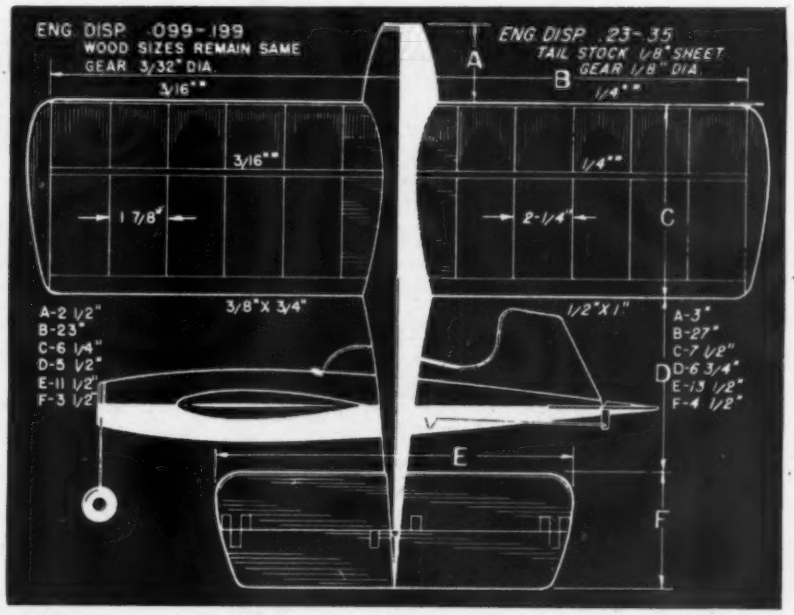
Any light lines may be used. Some little ships are flown for fun on thread, the builders feeling that the lines may be thrown away anytime and new ones tied on. Light cord can be used. The perfect lines would be .008 flexible or stranded wires. Fly the ship on 25-30′ lines.

For full-fledged stunting of the larger sized *Caper Cutters* it is advisable—as always—to incorporate all the usual offsets, tank connections, tip balancing, that experience indicates necessary.

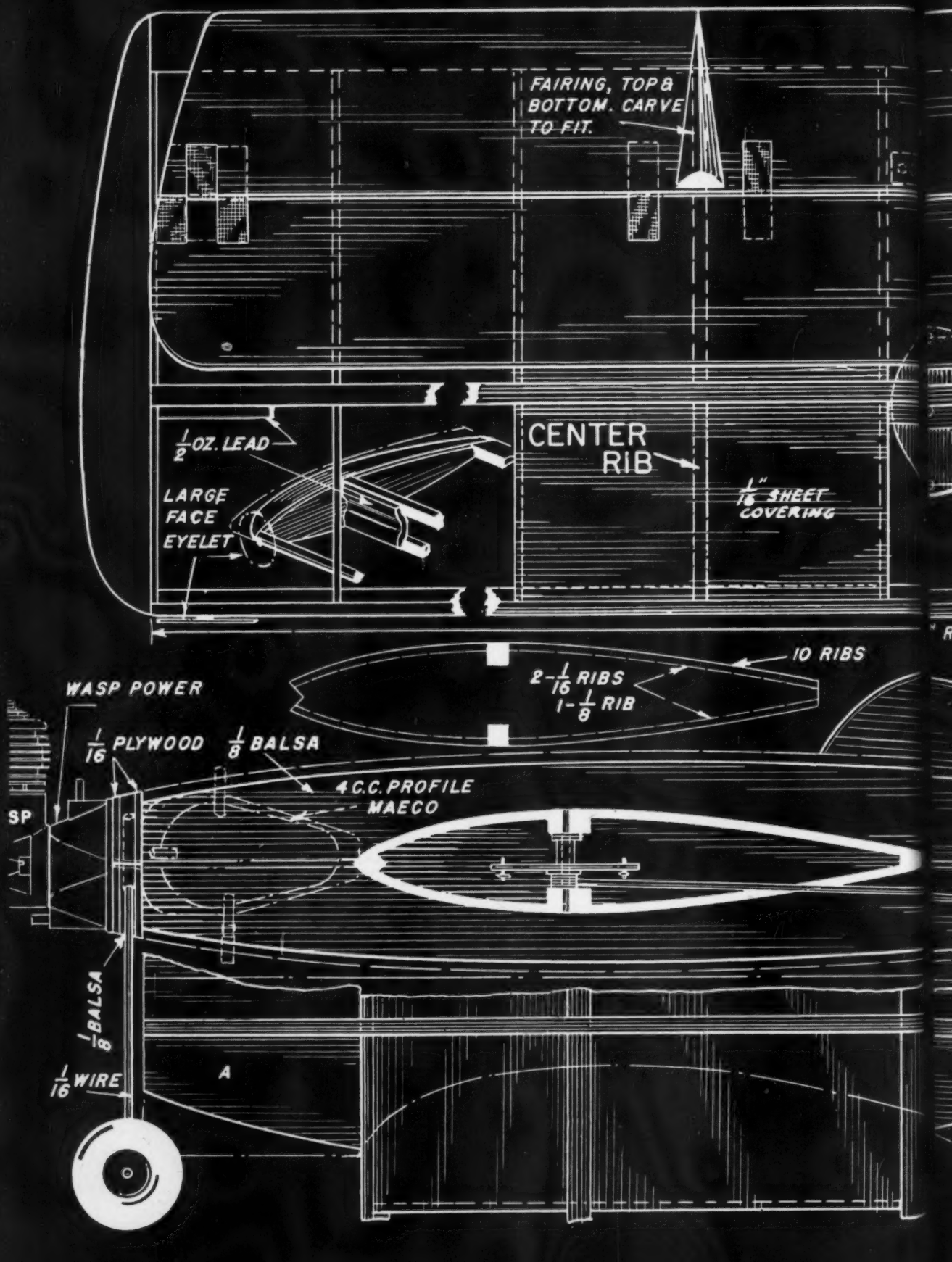
Plans for the small AA job follow on the next two pages; the drawing below gives data for all sizes of larger models.

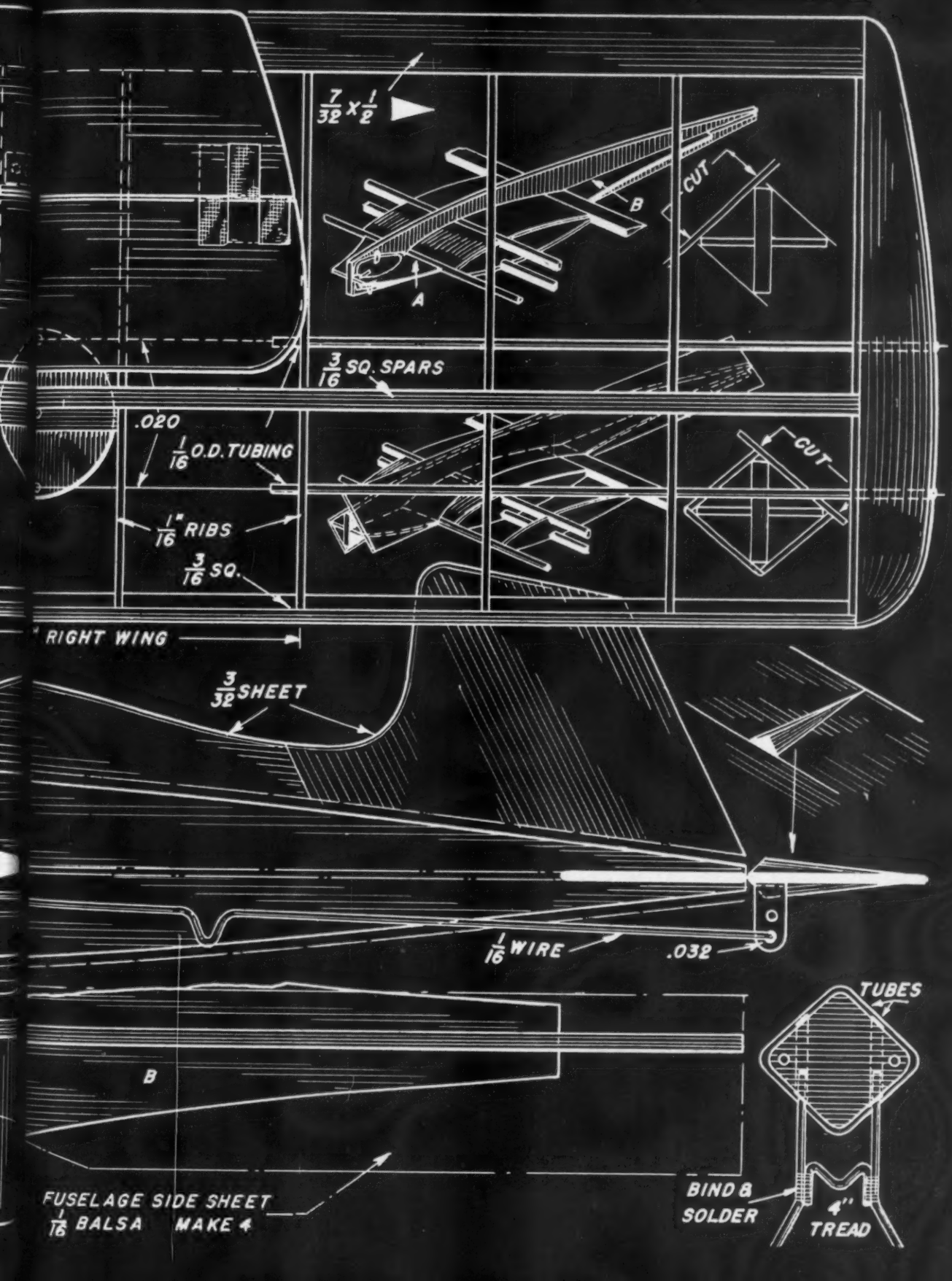


Generous wing area and moderately short tail movement arm contribute to good stunting ability.



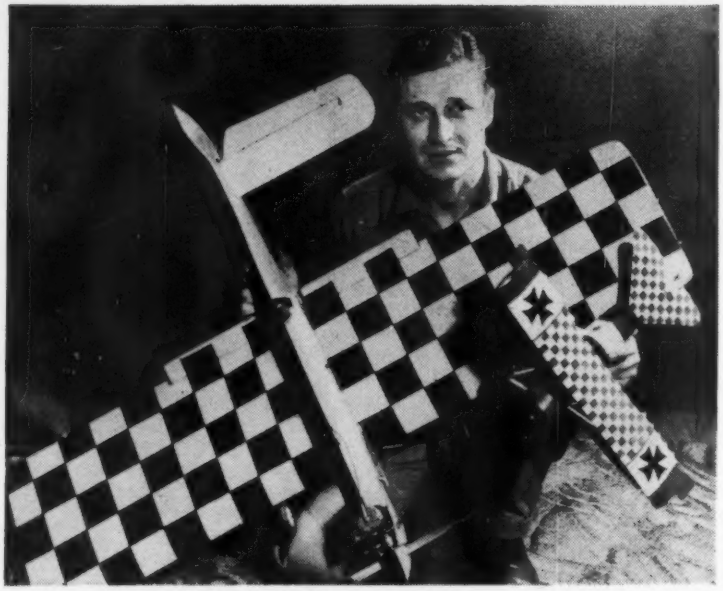
Right—By using the handy dimensions, ship can be scaled up from drawing to .09—.19, or .23—.35 categories.


FAIRING, TOP & BOTTOM. CARVE TO FIT.
1/2 OZ. LEAD
LARGE FACE EYELET
CENTER RIB
1/16" SHEET COVERING
10 RIBS
2-1/16 RIBS
1-1/8 RIB
WASP POWER
1/16 PLYWOOD
1/8 BALSA
4 C.C. PROFILE MAECO
SP
1/8 BALSA
1/16 WIRE
A

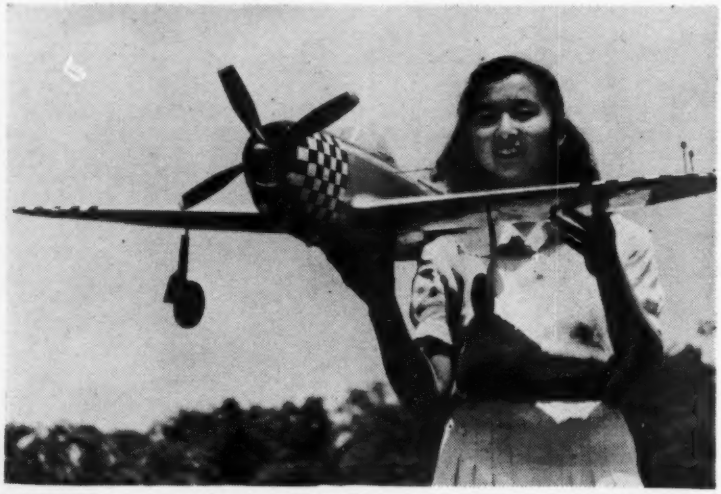

7/32 X 1/2
CUT
B
A
3/16 SQ. SPARS
.020
1/16 O.D. TUBING
1/16" RIBS
3/16 SQ.
CUT
RIGHT WING
3/32 SHEET
1/16 WIRE
.032
TUBES
B
FUSELAGE SIDE SHEET
1/16 BALSA MAKE 4
BIND & SOLDER
4" TREAD

air ways

All over the world modelers turn out masterful planes that seldom see a contest. Here's a sampling.



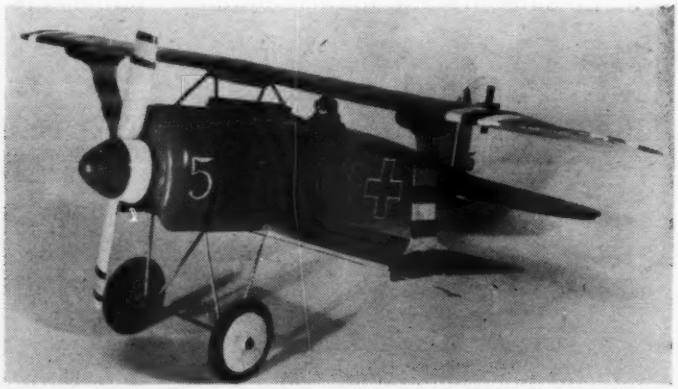
Orwick-powered checkered *Go-Devil Sr.* by Wilmar Leske, Aberdeen, S. D.; cute *Fokker Tripe* is the work of friend, Lowell Baltzell. It's an old MAN design, flown on 20' lines; Cub .045.



This beautiful controline-scale *Thunderbolt*, held by Miss Osaka, is representative of the fine ships being built in Japan. Models are popular, GI's competing in many of the contests.

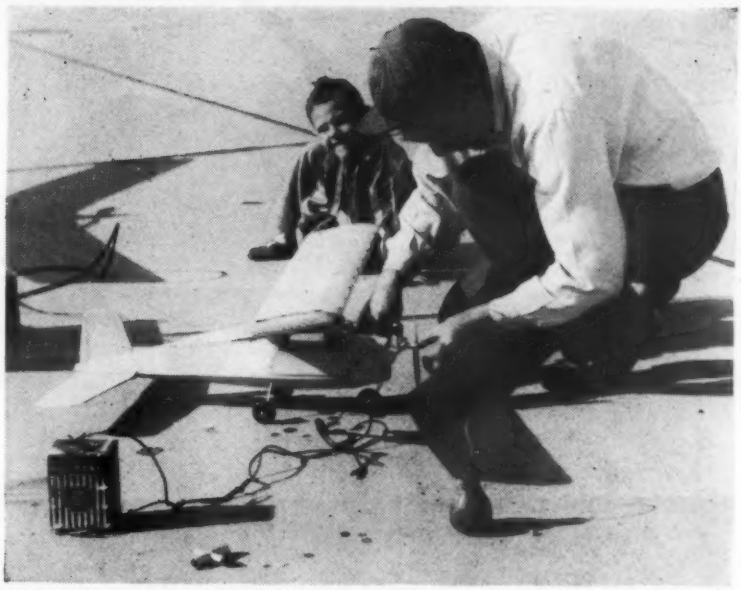
Speed demon, Alan Indge, Zombies club, England, turned an unofficial 140 mph with this job.

Seven-pound *Hawker Demon*, by John Dodds, England, has logged 18 months flying. Power is McCoy 60; nylon covering.



Biplane fans will get a kick out of this *Albotross DX1* by John Garwood, England. Built to 1/12th scale, it is powered by a *Mills* 1.3 cc. Diesel and weighs 15 oz.

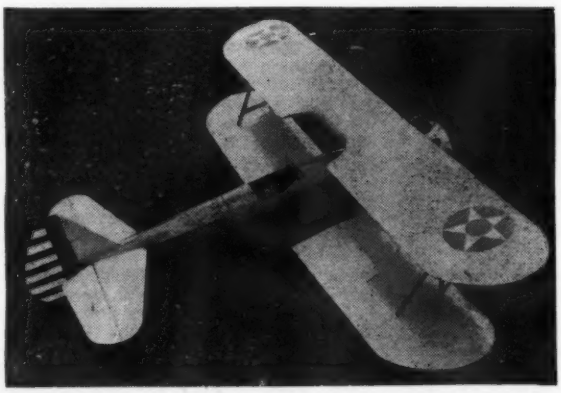
OUTSIDE of his dream ship of the moment, the most interesting thing to any modeler is the job the other fellow is building. If it weren't for pictures, such as the interesting selection in Air Ways each month, most of us would never be tempted to try other than our pet ideas. Contests may be the life blood of the activity but they produce highly stylized machines. It is the individual builder, working at home, flying out back, who expresses himself with something new and different. Where the contest job must be practical, easily replaced or patched, expected to crack up again and again, the ship that is made with none of these restrictions, usually is tops in appearance and highly original in design. This probably explains the great crowd interest in flying scale at contests. It is the only time that good craftsmanship—seen in every entry—is risked in the sometimes trying weather typical of contest days. We'd like to see more pictures of unusual models—like the ones you see here. These two pages are open to all.



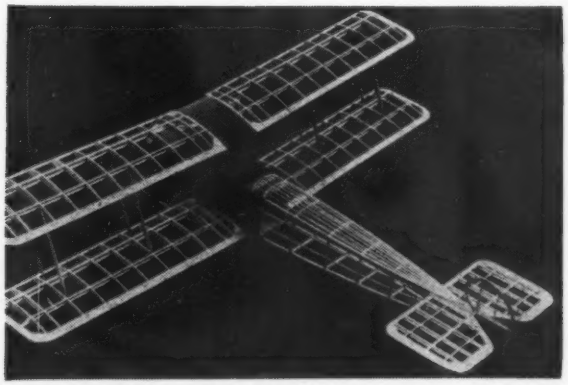
Smallest *Rudder Bug* in the world, by well-known rc fan Chet Freese. Has 2 sq. ft. of wing area, weighs 32 oz., Cub .09. Reacts quickly, does well in wind.

One-man good-will ambassador from American modelers is Cpl. Glen A. Haston, stunt man.

Everybody got into the act at this Osaka contest. Visible are two scale float gassies, one a bipe; a couple of flashy speedboats. Can that be a pulse-jet boat?



The always popular *Stearman* trainer, this time by Pete Westbrook, Zombies. Scale is 1 1/2", the power an Orwick .64.



One of the two famed WW I trainers, the *Avro*—the other being our *Curtis Jenny*—in gas free flight form; Dave Hughes, England

Team X 1/2A = Fun

PROTO and Team Racing, as developed by West Coast builders, have literally taken this country as well as Europe by storm. The engine and area restrictions plus realistic appearance not only keep the speeds down to a safe limit allowing some maneuvering but also reduce the advantages of "Hot" engines. Surprisingly enough most models of this type are built for pure sport rather than for competition purposes. Many scale types are adaptable to both Proto and Team Racing and several have won races.

Now that the 1/2*A* engines are here to stay, a junior edition of this phase of our fine sport is spreading even faster than its big brother. Simplicity of construction, economy of engine costs and ease of transportation plus a larger selection of flying sites (due to the small circle required) are reasons enough for its popularity. However the extreme realism of these models, as well as the fact that the builder can add his own pet ideas without being accused of being "off scale" seem to be the main attractions.

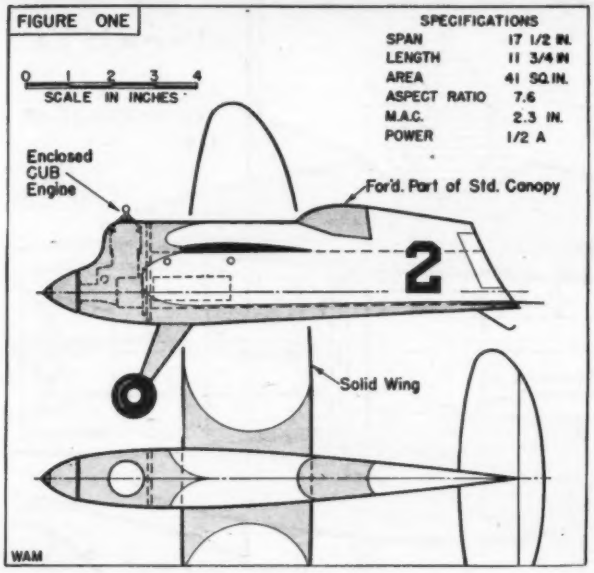
As previously mentioned, most of these models are used for sport. However, a set of rules should be formulated for the benefit of those who wish to participate in Team Races (and once you have you always will) and for classification purposes. 1. Based on our previous experience with small bore engine powered models, it does not appear practical to completely cowl the powerplant as on the larger class models; nevertheless it is not impossible and bonus points should be given to the models with this feature. 2. Models should resemble past, present or future designs and should possess a cockpit with pilot so located in order not to interfere with the engine installation, i.e.; The hypothetical pilot should have enough leg room up to the firewall (tank excluded). 3. Landing gear must allow the model to take off and land in conventional manner. Retracted gear should extend for landings. 4. Bonus points should be awarded to exact scale models. 5. Total projected wing area should not be less than 40 sq. in. 6. Engines must be in 1/2*A* category, and as we all know, the most powerful engines do not always win these races. 7. The fuel tank capacity should be restricted to 1/2 oz. thereby requiring several pit stops in each race for those hungry engines.

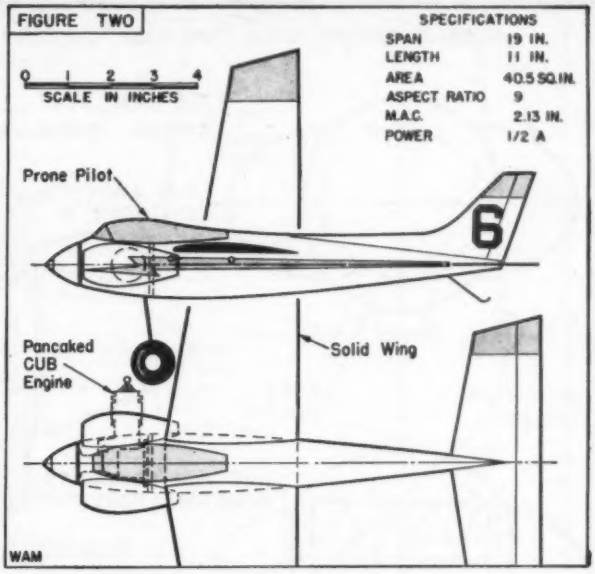
Obviously the above mentioned rules are in no way final, but we built our model in accordance with them and the result was a fast, easy-to-handle, realistic ship patterned after the present day Goodyear racers. The landing gear was located well forward in order to insure safe landings without propeller breakage. The fuselage size was kept to a minimum and although some may say the tail moment arm is too short, no trouble was encountered in so far as sensitivity was concerned. The model responded to every wrist movement and yet we flew three laps "blind" and were told that the plane did not change altitude more than 3'. This latter result is very beneficial in Team Racing in view of the fact that the other entrees must be surveyed many times during a heat in order to enable the flyer to spot openings etc. Our *Midget Racer* is fitted with a pancaked *Cub .074* engine. We used the largest of the small bore engines to test the effect it had on this size model. Top speed was between 70 and 75 mph without trying. Evidence leads us to believe that much higher speeds are feasible. The engine cylinder is partly enclosed with a standard plastic bubble canopy with the front and rear ends cut off. This seems like the perfect engine installation on these models to achieve realism.

The wide variety of designs that can be obtained in this class is illustrated in Figures One and Two. Our Figure One design stems from the pre-war *Thompson* and *Greve* Trophy racers with *Gee Bee*, *Brown* and Steve Wittman's Barn Doors characteristics thrown together plus some of our own ideas. It clearly illustrates that cowling one of these tiny engines is quite possible and smooth, clean lines can still be retained. Figure Two leans towards the future and is a figment of the author's imagination. With swept-back wings and tail surfaces plus the prone pilot position just over the pancaked engine, this design should make an interesting model racer, and performance should be as good if not better than more conventional designs. Both these models can be constructed using the same methods we used on our own *Midget Racer*. Scale is given for the benefit of those who desire to enlarge these drawings.

Some modelers may prefer to build our *Midget Racer* in the Big Brother 125 sq. in. minimum area size whereupon we sketched a small plan with suitable scale (Figure Three). This model will take any engine of .29 size. Here again construction is identical to the smaller plane except that construction should be proportionately heavier. A larger cowl than that which is illustrated will be required to enclose the entire engine and meet the Team Racing Rules for the 125 sq. in. class.

Now to get started on this 1/2*A Midget Racer* model. Begin construction with the fuselage. Cut out the sides from sheet





by WALTER MUSCIANO

A bevy of fast easy-to-fly, realistic speedsters for both AA and standard team rules

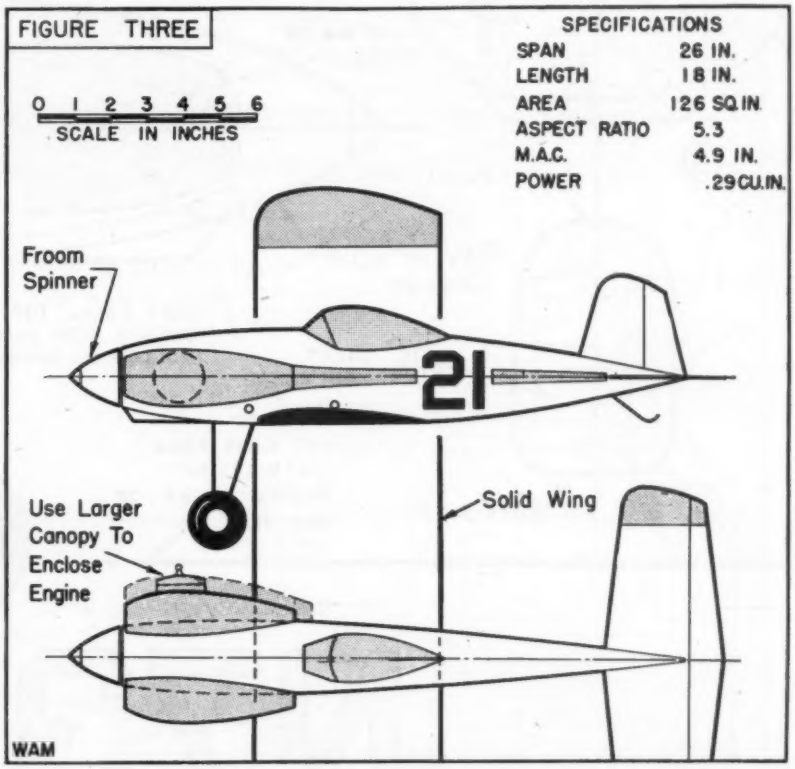
balsa and join at the rear while installing bulkhead C. When dry add the 1/8" plywood firewall B. Add the soft balsa sheet to the fuselage bottom behind the wing and cut to shape. Cut out the tail surfaces and sand smooth. Add the control horn to the elevator and hinge the tail surfaces together. Cement the stabilizer to the fuselage, then screw the bellcrank to the mount and add the leadout lines. Cement the bellcrank assembly in place securely and connect the control rod to the horn and bellcrank. The control rod is passed through a 1/8" hole drilled in the fuselage bottom.

The landing gear installation depends on two things: Whether you can obtain dural sheet in your neighborhood and whether or not you prefer dural landing gears to the more conventional music wire variety. When it comes to the type used on this model, i.e., wide cantilever design, we prefer the .045" dural type and used it on the prototype model. Plans illustrate the more conventional wire type with plywood fairings. This is sandwiched between the firewall and a sheet of 1/16" plywood using plenty of cement as the bond. Apply several coats. Cement the fairing in place and wrap to the wire with fine tissue.

The fuel tank is made from thin sheet brass or, if desired, a commercial tank can be fitted. Screw the engine to the firewall using round head wood screws. Connect the fuel line and cement the fuselage top and nose bottom in place. Carve and sand to the correct shape and cut out the cockpit. Add the fin and rudder making certain that the rudder is offset as the plans indicate.

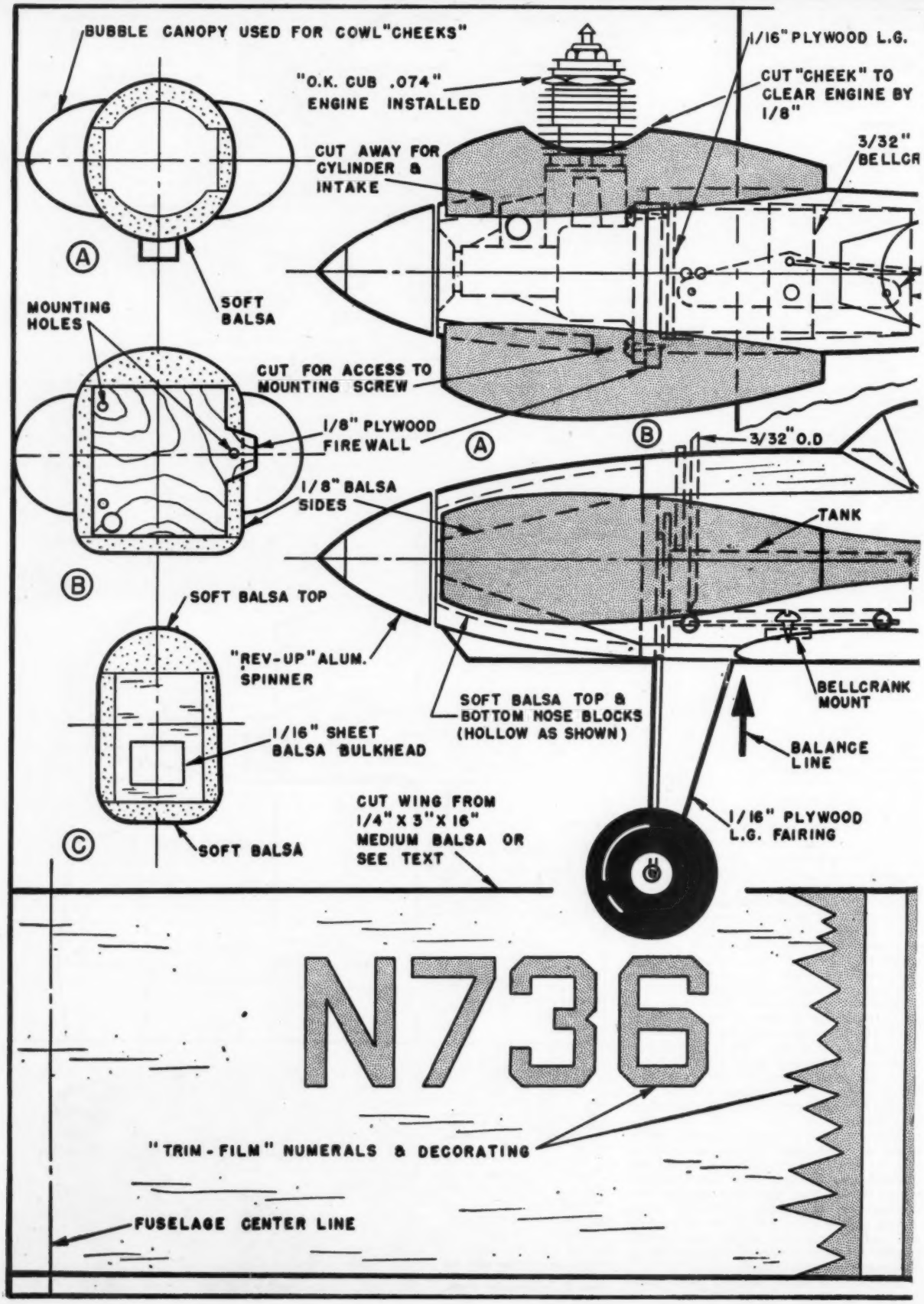
The wing is solid medium balsa made

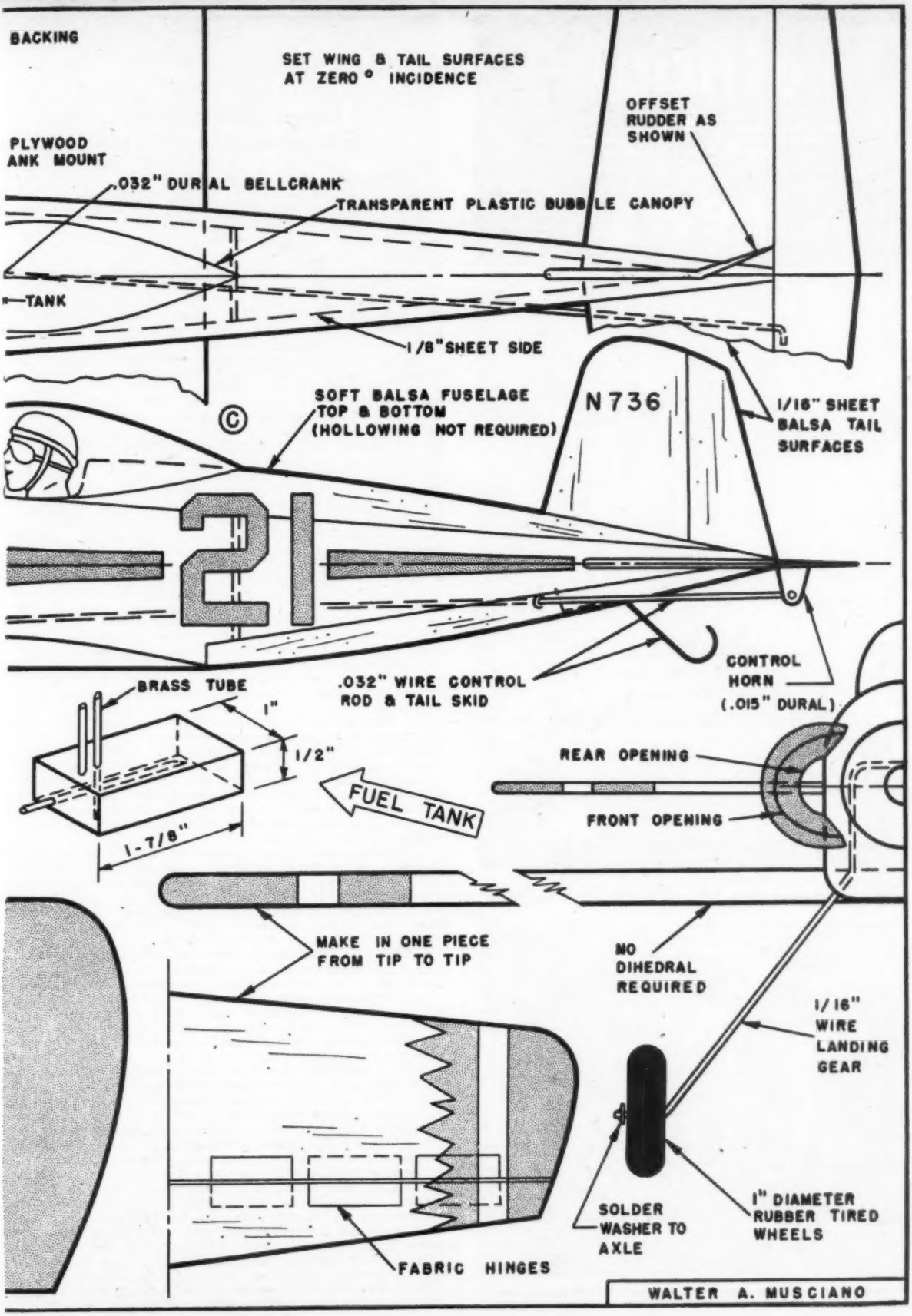
(*Turn to page 53*)



Opposite page—Built from accompanying plans, .074 *Midget* did 70 mph. plus; flew 3 laps blind. Fig. 1 and 2: variations on theme. Fig. 3: Three-view for enlargement, .29 engines.

Right—The Author with the *Midget*. Wing was made from 3" wide glider stock.


BUBBLE CANOPY USED FOR COWL "CHEEKS"
"O.K. CUB .074" ENGINE INSTALLED
1/16" PLYWOOD L.G.
CUT "CHEEK" TO CLEAR ENGINE BY 1/8"
3/32" BELLCR
CUT AWAY FOR CYLINDER & INTAKE
A
SOFT BALSA
MOUNTING HOLES
CUT FOR ACCESS TO MOUNTING SCREW
1/8" PLYWOOD FIRE WALL
A
B
3/32" O.D
1/8" BALSA SIDES
TANK
B
SOFT BALSA TOP
"REV-UP" ALUM. SPINNER
SOFT BALSA TOP & BOTTOM NOSE BLOCKS (HOLLOW AS SHOWN)
BELLCRANK MOUNT
1/16" SHEET BALSA BULKHEAD
BALANCE LINE
CUT WING FROM 1/4" X 3" X 16" MEDIUM BALSA OR SEE TEXT
1/16" PLYWOOD L.G. FAIRING
C
SOFT BALSA
N736
"TRIM-FILM" NUMERALS & DECORATING
FUSELAGE CENTER LINE


BACKING
SET WING & TAIL SURFACES AT ZERO ° INCIDENCE
OFFSET RUDDER AS SHOWN
PLYWOOD ANK MOUNT
.032" DURAL BELLCRANK
TRANSPARENT PLASTIC BUBBLE CANOPY
TANK
1/8" SHEET SIDE
SOFT BALSA FUSELAGE TOP & BOTTOM (HOLLOWING NOT REQUIRED)
N736
1/16" SHEET BALSA TAIL SURFACES
21
.032" WIRE CONTROL ROD & TAIL SKID
CONTROL HORN (.015" DURAL)
BRASS TUBE
1"
1/2"
1-7/8"
FUEL TANK
REAR OPENING
FRONT OPENING
MAKE IN ONE PIECE FROM TIP TO TIP
NO DIHEDRAL REQUIRED
1/16" WIRE LANDING GEAR
SOLDER WASHER TO AXLE
1" DIAMETER RUBBER TIRED WHEELS
FABRIC HINGES
WALTER A. MUSCIANO

official AMA news

The latest info compiled for contest modelers everywhere

by Russ Nichols
Executive Director A M A

Brewer Trophy award for 1950, for outstanding contribution of air youth in education and training field, went to Lt. John R. Burton, USN.

Payload rules for 1951 include A/2, combined A and B, cargo event for carrying maximum load for an official flight of 40 sec. minimum.

THIS column is being started to keep you, the model flyer, posted on important aeromodeling developments. It is our intent to keep you informed on such things as new rules and the effect they are likely to have, elections, important contests, review of record holders, international news and, from time to time, info on gaining club interest and more effectively running contests, just to name a few objectives.

Modeling in 1950 showed many improvements over 1949. A quick check shows that nearly 400 contests were sanctioned and 100 new records were established during 1950. Many of the contests showed administrative improvement, especially true at the larger meets. A preliminary breakdown of the figures proves interesting. For instance, of all the licenses issued, less than one-quarter went to Junior flyers (under 15 years of age). Are we neglecting our younger flyers? Also interesting is the ratio of models built from kits to those built from original designs that established free flight gas records last year. In all, over one-half of the record holders were built from either manufactured kits or magazine plans. This seems like a new trend that has been made possible by better engineered kits.

The advent of the 1/2A class for the small motors has been a terrific boost to the popularity of free flight gas models, not only in contest flying, but in sport flying as well. At the same time, we have seen a decrease of enthusiasm over the larger classes. It is believed that this decrease is due largely to the fact that present day motors have nearly twice the power of those built in pre-World War II days, and models built for them generally are twice the size of those formerly built. These more powerful motors have had quite an effect on controline speed models too. They seem to be getting smaller, lighter, and faster.

1951 Wakefield. The 1951 Lord Wakefield Trophy Committee has, for the last several months, been conducting a poll of elimination methods to determine the one best suited. Under the chairmanship of Ed Lidgard, well known Wakefield flyer and member of the 1950 Contest Board, the committee prepared a two-page letter which was mailed to AMA Leader members and all known Wakefield flyers. Besides the poll of elimination methods, the committee made known their decisions thus far reached. They are:

1. The eliminations must be set up early in order that all finalists may be chosen at least by the second week in June.
2. A requirement should be placed on all elimination finalists that they agree in writing to take their own model or send their own model and, if unable to do so, they must relinquish their place on the team to the next in line within two weeks after the semi-finals.
3. Wakefield rules will be complied with 100%.
4. All eliminations must be run, rain or shine because the finals will be run under the same conditions.
5. Regardless of the outcome of each elimination, no finalist will be approved unless he averages 2 min. If the winner of an elimination does not make 2 min., then the best second place time of all other elimination contestants in other areas will take his place.

Since Aarne Ellila has once more won the Wakefield Cup for Finland, the 1951 final competition is scheduled to be held again in Finland. The Suomen Ilmailuliitto, holder of the Cup at present and governing body for sporting aviation in Finland, has not yet made announcements as to the exact date and location of the final competition and it is assumed, therefore, that arrangements will be nearly the same as last year. That is, the event will probably be run at Jami-Jarvi, center of Finland's glider movement, about the end of July. The United States plans on being represented by six Wakefield Team members in person this year. Ed Lidgard, Chairman of the *1951 Wakefield Committee,* is currently working toward the sponsorship of our Team and will appreciate any suggestions that you have to offer. His address is 814 Bryan Street, South Bend, Indiana.

Much has been left unsaid about those who assisted immeasurably in the handling of our Team members' models.

Trends in free flight continues to smaller airplanes. A/2 jobs have boosted both contest, sport flying. Less enthusiasm for large ships.

Small engine development has cut into beginner interest in rubber. More events, emphasis on youngsters, being suggested by many leaders.

Even the Post Office Department, when informed that most of the boxes for the models were too large for Air Parcel Post, gave permission for the models to be shipped in oversized boxes. Immediately upon mailing the boxes to Finland, AMA Headquarters contacted the State Department here in Washington to find out what assistance could be expected from them and the U. S. Legation in Helsinki. They took complete charge of returning the models. The American Legation did an excellent job of repacking all models in one large box and shipping them at no expense to AMA. For this help, the State Department cannot be thanked enough.

New Payload Rules. Looks like a big year for *PAA Load* flying this year. George Gardner, Educational Director of *Pan American World Airways System*, has announced PAA's plans for the modeler during 1951. Realizing the rapidly growing popularity of regular 1/2A free flight flying, PAA is concentrating on the small models. In addition to a Class 1/2A PAA Load event, PAA is to sponsor a Special Clipper Cargo Event for 1/2A free flight models at the 1951 *Nationals*. With the inclusion of the 1/2A events, PAA decided that Classes A and B PAA Load flying would be combined into one event this year.

1951 rules for PAA Load flying are very similar to regular AMA rules for 1/2A, A, and B Free Flight Gas with the exception that models *must* rise-off-ground and carry flight dummy occupants which shall not be essential to the operation of the model. For 1/2A models, the requirement is that one occupant shall be carried which consists of a body at least 1-1/2" wide by 2-1/4" high by 3/4" thick and surmounted by a head at least 3/4" x 3/4" x 3/4" weighing at least 3 oz. Class A and B models are to carry occupants with a body at least 3" x 3" x 1" with a head at least 1" x 1" x 1", weighing at least 8 oz. Since Class A and B are combined into one event, Class A models shall carry one occupant and Class B models, two occupants. PAA Load occupants are to be carried in an upright position relative to normal flight, facing forward, within an enclosed compartment providing visibility through transparent areas. *Visibility* must be at least 3/4" in height and width for 1/2A models and at least 1" in height and width for A and B models to the front and to both sides and the heads of the occupants. Occupants are to be readily removable from the compartment for checking.

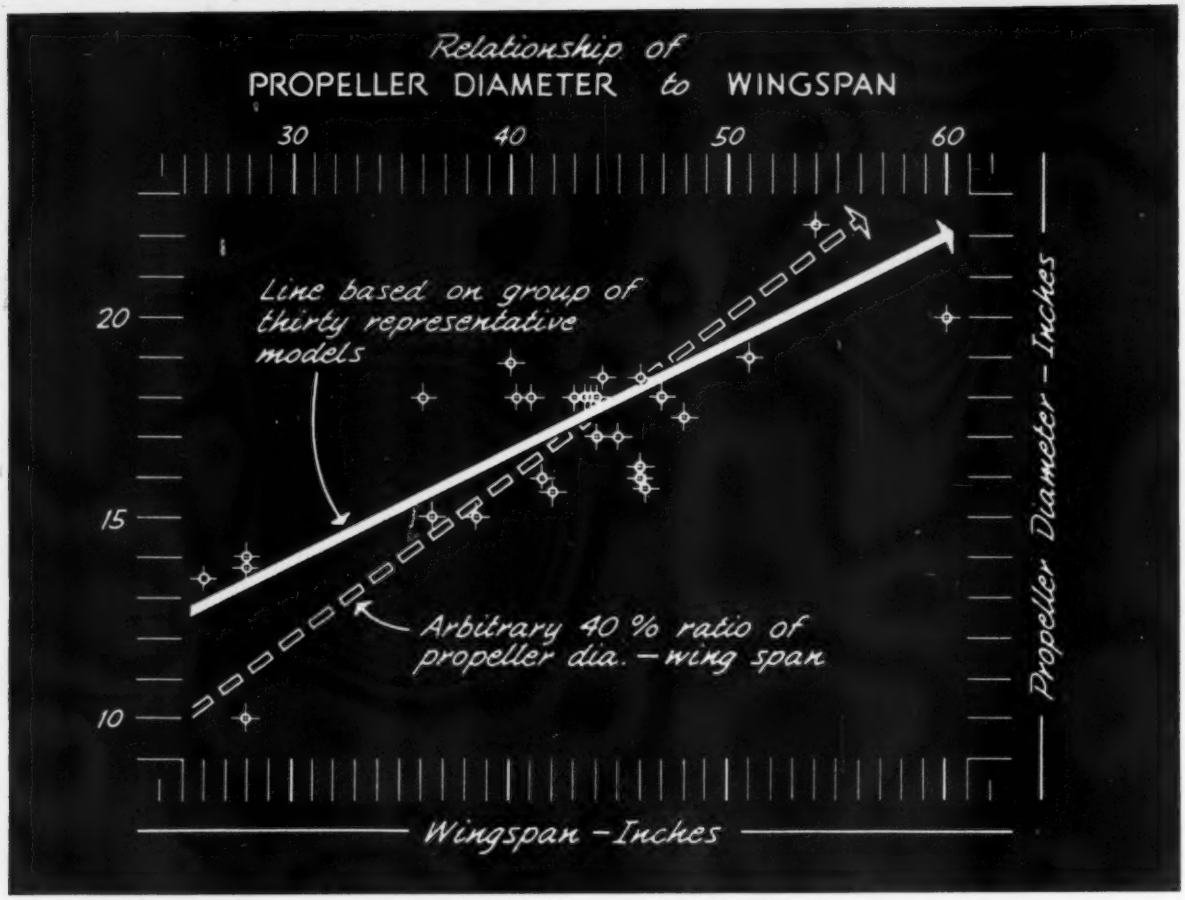
Clipper Cargo Event. The Clipper Cargo Competition to be sponsored by PAA only at the Nationals is for Class 1/2A models only, with all age classes being combined to determine the contestant who can send aloft the greatest amount of payload on an official flight over 40 sec. and land the model safely. Rules for the contest are the same as regular AMA 1/2A Free Flight Rules except that the weight load must be carried inside the cabin or fuselage and secured so that it will not shift during flight. Although payload material may be of any substance or shape, it is suggested that contestants choose material that can be built up or cut down easily.

Prizes for PAA sponsored events at the 1951 Nationals will be as follows: first, $100; second, $75; third, $50. For other 1951 events sponsored by *Pan American World Airways*, specially designed trophies will be awarded through third place in each event. If we know PAA, they'll be terrific.

International News. The *International Glider Contest* held in Sweden one week after the *Wakefields* was a great success. Eight countries were represented in the first really international model glider event to be held. Visitors were accommodated at a school used for teaching skiing during the winter months which proved to be excellent, since it was arranged in small buildings similar to our tourist courts. It is reported that all models entered were built to a high standard, with pod-and-boom types with fairly high aspect ratio and only tip dihedral being predominate. Seems as if the Scandinavian

(*Turn to page* 48)

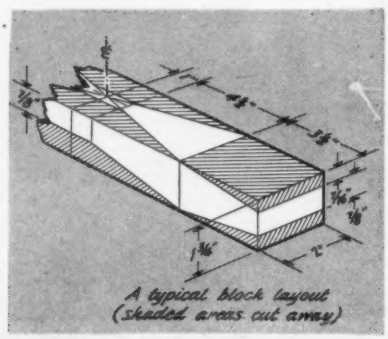
Suprise development of recent years is big interest in ROW events. Floats greatly reduce crack-ups, yet permit reasonable performance.



How to pick the right size prop for your new rubber job. Interesting to note that diameter reduces in proportion on large models.

Design Detail

by H. A. THOMAS



Type of blank almost standard in this country.

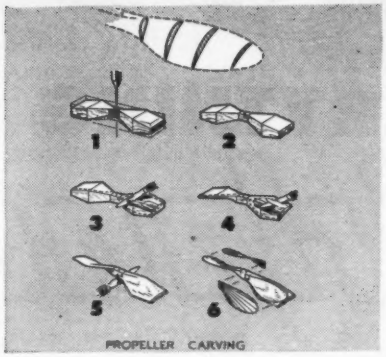
FEW gas modelers appreciate the propeller's importance (beyond the fact that it costs a quarter) as the experienced rubber model builder has been brought to appreciate it. Yet, oddly enough, the propeller, once its construction is mastered, becomes a part to be enjoyed rather than dreaded in building the model. Likely to a greater degree than any other single part, the over-all success of the plane depends on the propeller—its design, workmanship and adjustment.

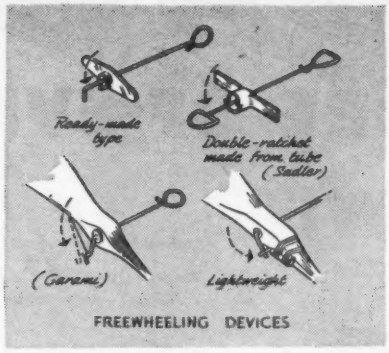
For a simple means of determining propeller size for a particular model, wingspan may be considered a guide. Generally, a propeller of approximately 40% the model's span is adequate but, (see the chart) checking some rubber models of varying sizes indicates that as spans reduce, the propeller diameter can be enlarged somewhat, while the largest sizes of rubber jobs tend to use relatively smaller propellers.

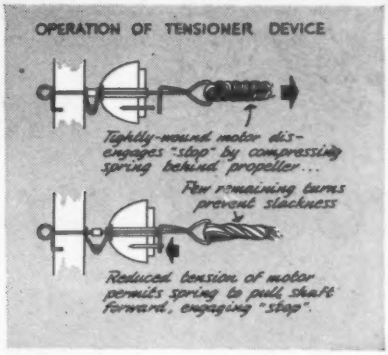
Pitch is something a beginner can go overboard on. Laying out, carving and installing a propeller to precise pitch is a task but few modelers can handle. However he should remember that low pitch means fast climb (for a given motor), that higher pitch makes for greater duration and, if power is adequate, greater speed. The pitch, or distance the propeller moves ahead in a single revolution, can fall somewhere between the diameter and up to twice that figure. Blade area should roughly correspond proportionately to the model's wing area. True pitch implies that all points along the twisted blade pull to the same extent. The larger sweep of the tip requires a flatter angle; the small circuit in a revolution of parts near the hub require steeper angles to keep up. Drawing, below left, indicates a block layout using straight saw cuts.

Here are pointers to remember in propeller carving: 1. Using uniform texture wood, lay out block accurately, drill shaft hole preferably on drill press. 2. Make block cuts perpendicularly. 3. Carve lower surface first, cutting from upper right to lower left of blade for a right-hand propeller. Make slicing, diagonal strokes with sharp penknife. 4. Reverse propeller and carve away material on upper surfaces, leaving edges fairly thick and tapering in thickness from hub to tips (sketch indicates desired sections with slight undercamber). 5. Sand smoothly comparing blades with each other, make first trial balance. (From this point on, balancing is a ritual following each step.) 6. Trace blade pattern, trim blades to outline, smooth edges, rounding leading edges, tapering trailing edges thinly. Apply dope, sand, balance and repeat for additional coats. Add extra dope to lighter blade.

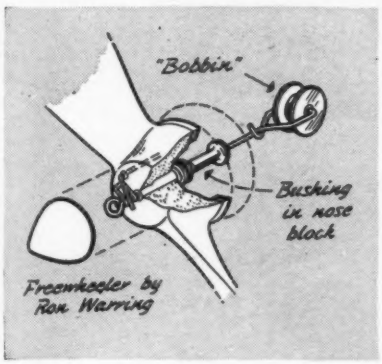
Propellers are made to freewheel or fold to reduce drag during the glide. The sketches indicate several freewheel devices that will vastly improve performance. They also show how a tensioner works to prevent unwound strands from shifting within a model to upset its balance. Another drawing illustrates a freewheel device for large Wakefields. Simple one-blade folders are sketched in also, these being typical of current British practice. The most advanced type

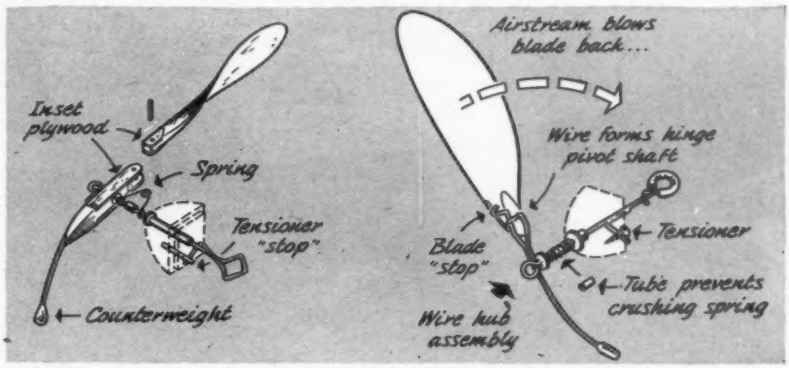






Left to right—Carving not difficult—if you follow this procedure. Freewheelers are plenty good for sport and some experts use them in contests; almost standard abroad. Tensioning allows longer rubber, hence more turns by winder.





Left—A standard English free-wheeling device which permits a clean nose design with spinner. Bobbin prevents rubber knotting around shaft. Above—For sharp contestants, hard inserts make for small hubs; wire is the cleanest of all.

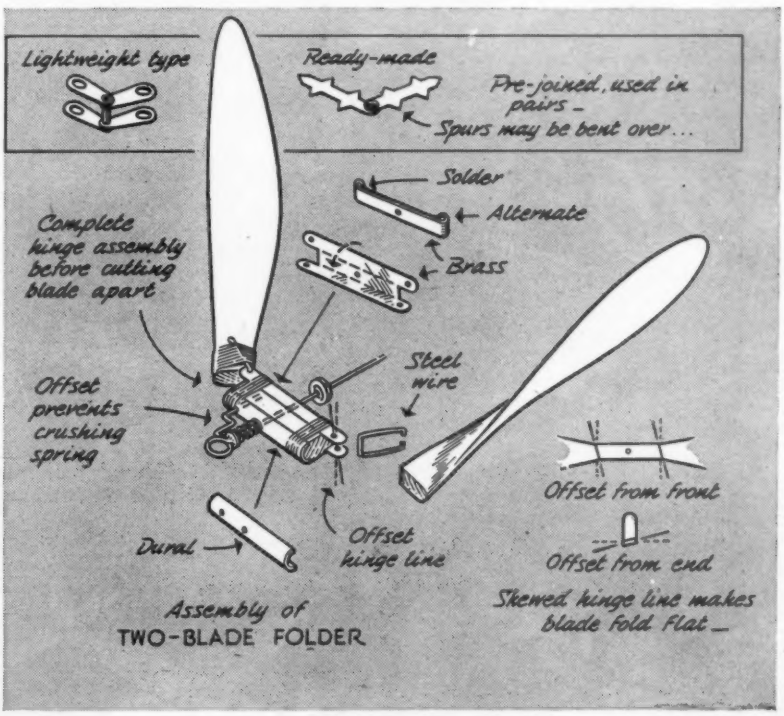
Would you like to design and build your own creations? Then this new series of how-to-do-its will be down your alley

of propeller, the two-blade folder, is illustrated (right). Several types of hinges are shown, the object being to provide free hinging without play or wobble. Note the skewed hinge line which makes for flat folding against the fuselage side.

Larger props are tissue- or silk-covered for durability. Shaft alignment is of utmost importance. The one-blade folder somewhat minimizes this problem though any error in alignment (as seen from end view of blade) can vastly alter the pitch angle. Actually, this can be intelligently used (by bending the shaft) as a factor in adjustment, used with varying strands and motor lengths in adjusting toward optimum pitch-power.

A recent trend in propeller blank layout is to pattern the outdoor prop on an indoor style blank, which means that two diagonals are drawn from opposite corners, crossing in the middle of the block. The blade is kept within the diagonals. While a more or less standard 2" width would suffice for an old-style block, the diagonal type block might be 3" wide. Although a larger block costs more the performance gain is considered worth it. An interesting trend in Wakefield type models is toward shorter motors with much less tensioning, and less wasted turns.

Free-wheelers on large models have various pros and cons. They are simpler to make, are said to have beneficial effects on trim. However, they are subject to breakage, hence require long fixed landing gears. Duration of the glide is shorter.



Good folding prop must have sturdy hinges; real expert offsets hinge line to fold blade neatly.

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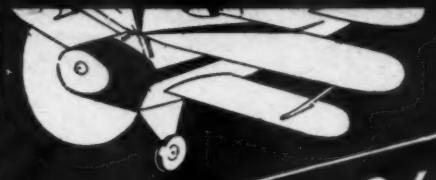

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R1—TAYLORCRAFT
Wing Span 21 in.

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- Windshield of clear plastic-cut out and finished.
- Numerals are die cut with glued back . . . apply water to stick on.

D1—LUSCOMBE SEDAN
Wing Span 23½ in.

LUSCOMBE SEDAN *GAS MODEL*

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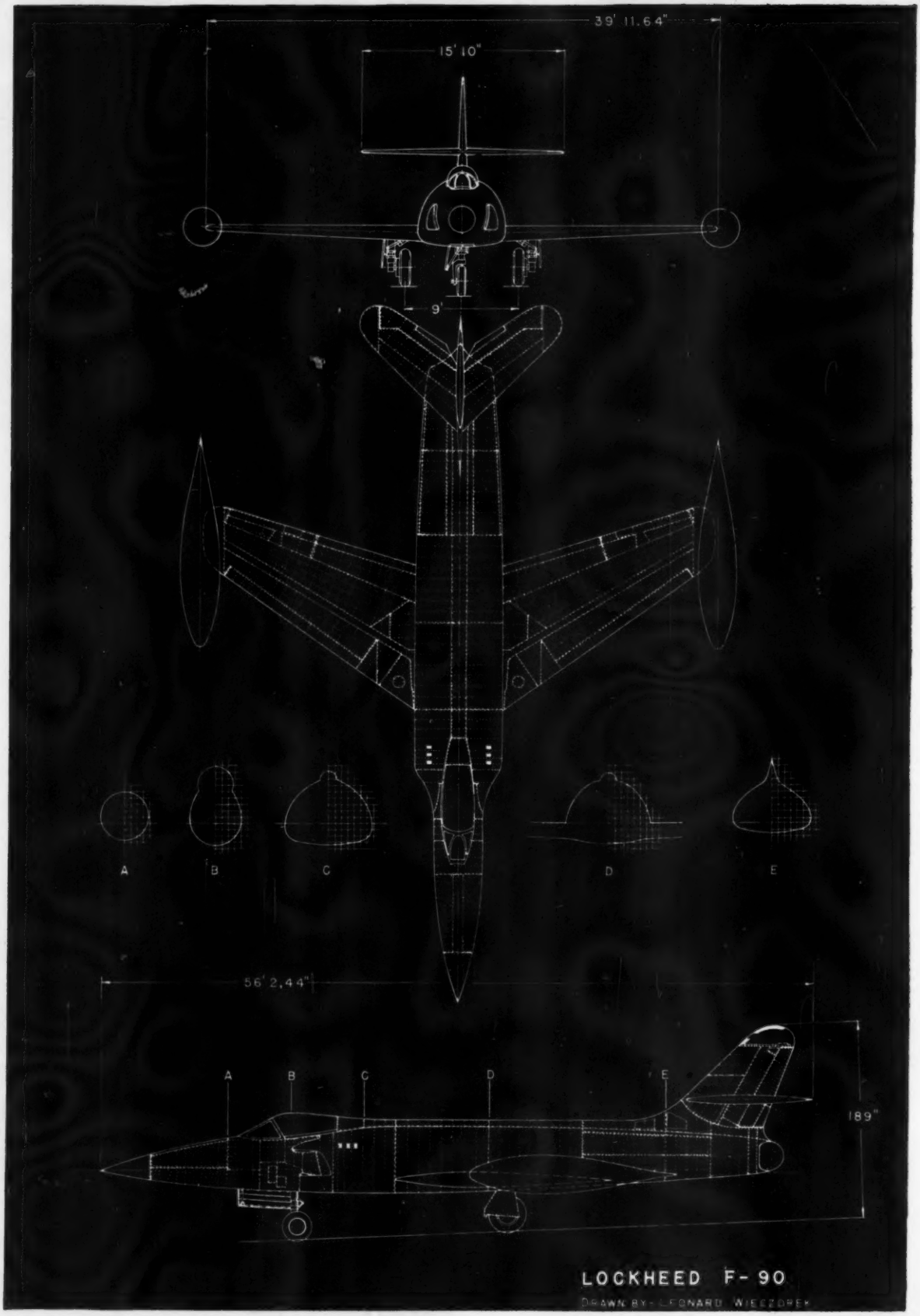
39' 11.64"
15' 10"
9'
A
B
C
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56' 2.44"
A
B
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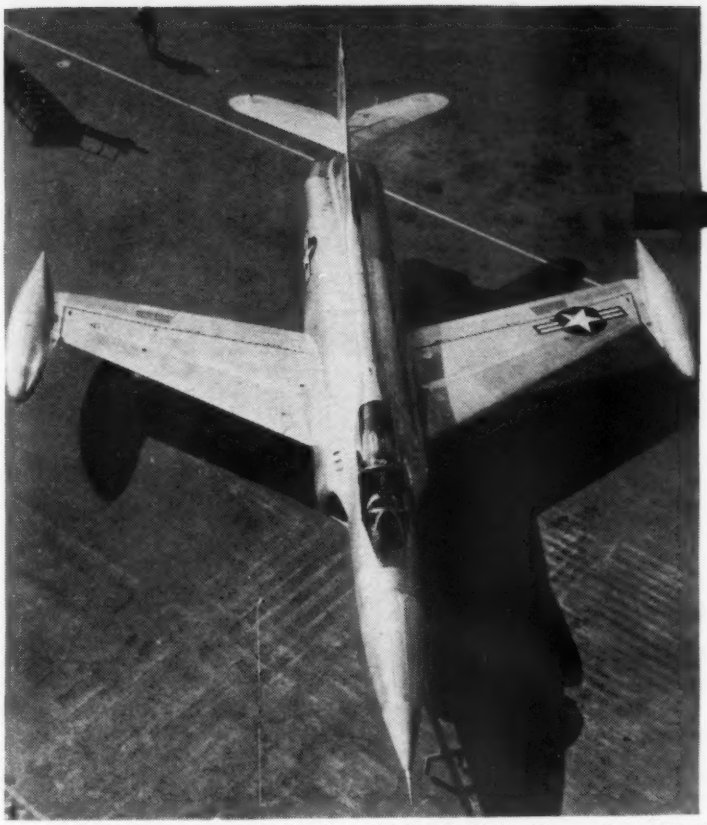
189"
LOCKHEED F-90
DRAWN BY - LEONARD WIECZOREK



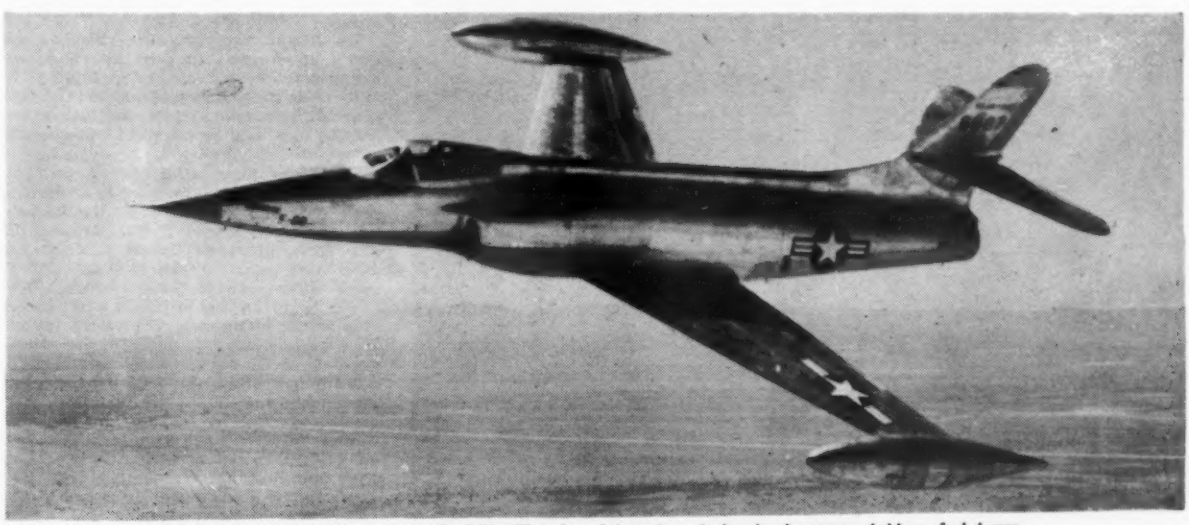
Lockheed F-90

Model planes star in development of the Air Force's new jet F-90 penetration fighter

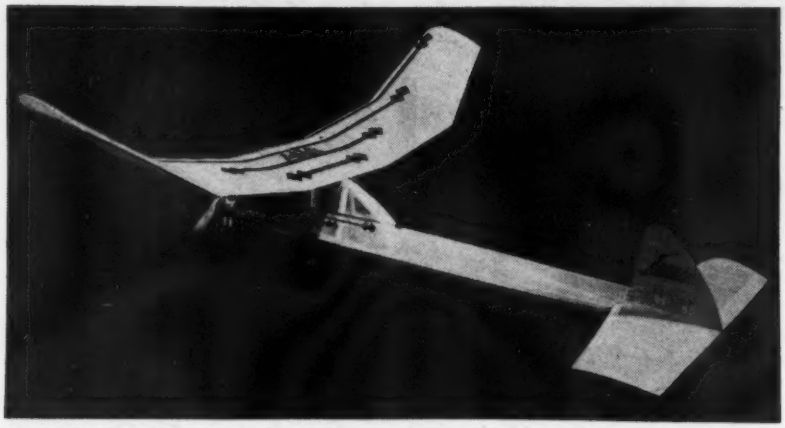
Combination of sweepback in wing and tail with side-by-side mounting of *Westinghouse* turbojets makes the *F-90* distinctive, even among the current crop of jets. Droppable tip tanks help fulfill design goal of long range fighter to mix it up deep in enemy territory.

MODEL airplanes figured prominently in the development of the *F-90*, a new Air Force penetration jet fighter designed to fly and fight deep within enemy territory. One half of the data usually found by risking a pilot's life in wild dive tests was obtained by dropping steel-and-plastic scale models from 35,000'. Screaming earthward these little *F-90's* used their tiny radio sets to broadcast a continual record of performance. Control surfaces were moved automatically to send the small ships through maneuvers. Tiny wind tunnel models simulated high speed flight tests, pioneering wind tunnel improvements of national importance.

The needle-nosed *F-90* is powered with two *Westinghouse J-34* engines of 3,000 lb. thrust each. The 55' long fuselage is 15' longer than the thin wings which angle back at 35° of sweep. Now undergoing secret tests at the Air Forces desert flight base at Muroc Dry Lake, Cal., the 26,000 lb. terror is in its fourth year of research and development, typical of the timetable for modern fighter development. Begun in August, 1945, as a design the *F-90* was accepted by the Air Materiel Command in 1947 for development and prototype construction. Two years were required to analyze all the possible configurations, including a full delta-wing job and 64 other major shapes. According to the Air Force, the projectile-like *F-90* is now at the mid point of a long test and research program which will extend throughout the ship's entire service life. Armament details are restricted.



Designed to absorb battle damage, the *F-90* will seek such targets as trains, truck convoys, bridges, fuel dumps.

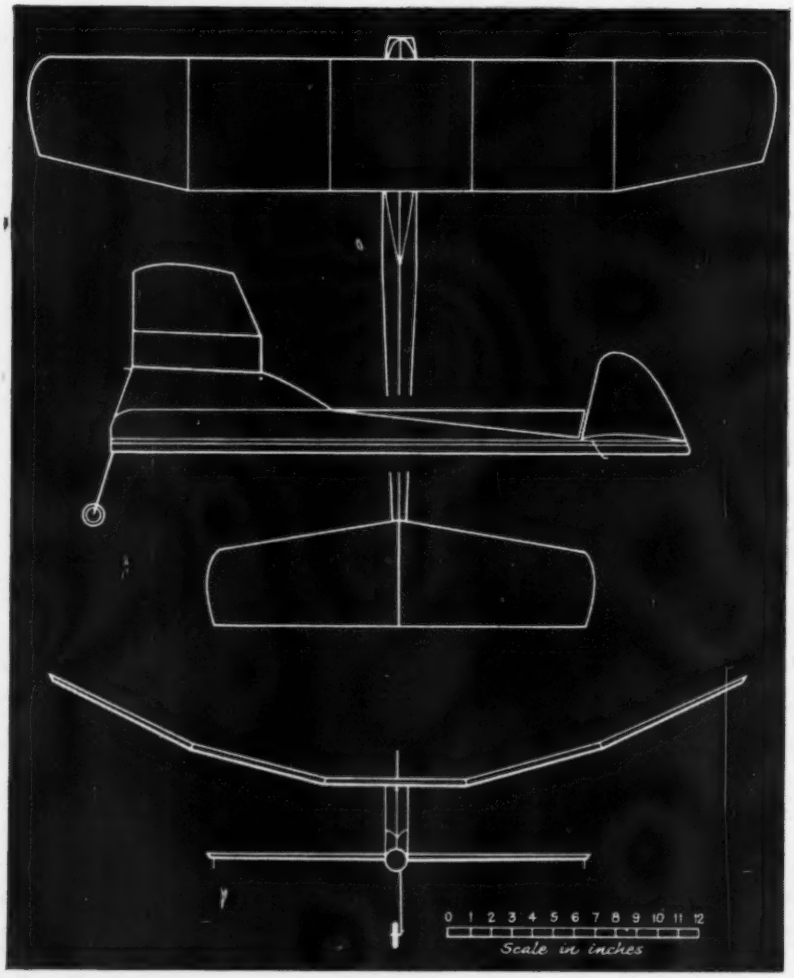


With its cabin built upon a crutch, long fuselage, multi-break polyhedral wing, author's A/2 manages to be distinctive without becoming complicated. Cleaned up lines permitted increase in area.

something NEW in payload

by **FRANK EHLING**

Last Nationals Half A payload winner creates special design for the new Pan American rules. Includes info for scaling up as hot Class A job



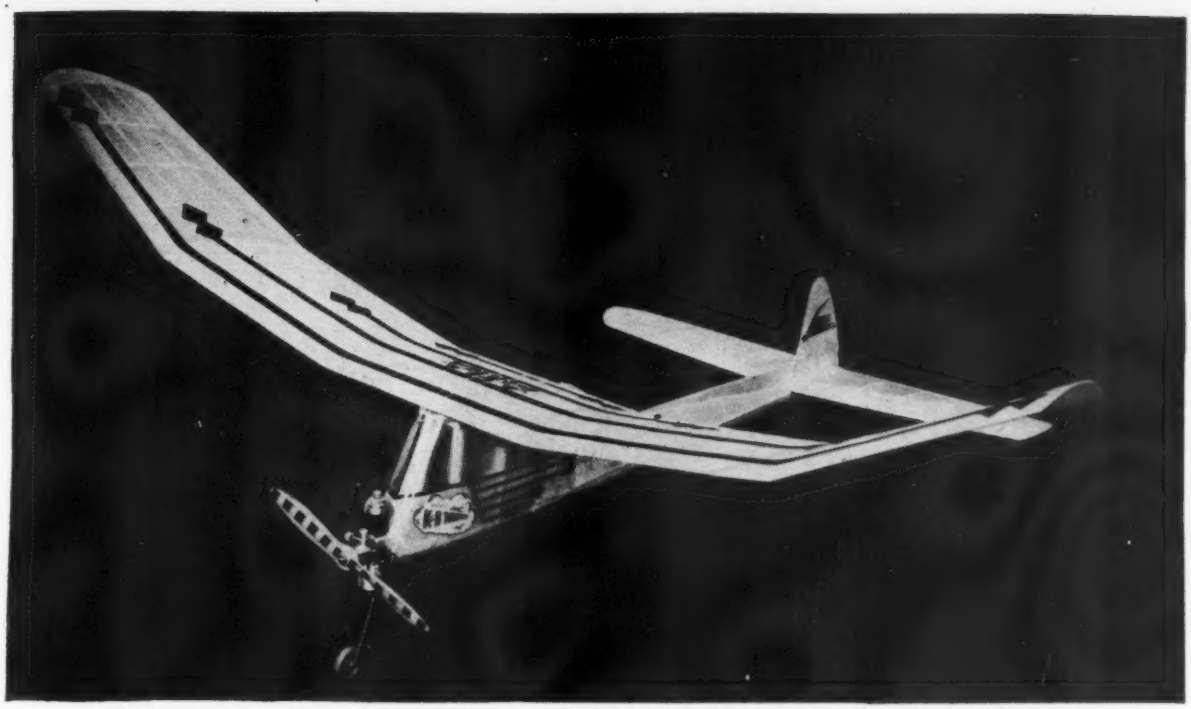
WITH the ever-increasing interest that is being shown in the A/2 Pay Load models, and considering the number that showed up at the *Nationals* last year, this event is bound to become popular. Right now kits are under way. They will be popular since the builder can build a model of this small size quicker, in much less space and using less material. After all, if you do have power to spare, it can be converted into pulling a larger model which can carry the 3 oz. that is required. Don't think for a minute that these models are of the slow moving type, as they can turn in flights that will cause many a pair of legs to tire from running.

Atlas, my 1951 Half A payload job, was designed expressly for competition under the new rules just released by *Pan American World Airways*. Last year I was lucky enough to win the combined-age class Half A payload event at the Dallas *Nationals*, that being a test of the modelers' reaction to the idea of small weight lifters.

The plans for the design which appear with this article are a development of the 1950 airplane, whose bulkiness—due to the old dummy specification which required a 4" deep fuselage—contributed heavily to drag or air resistance. The design shown here could be slimmed down considerably because of the smaller dummies, making possible a cleaner airplane, hence a larger one. The wing area has been increased to about 215 sq. in., or about 200 sq. in. if calculated by projected area.

Its design interprets the rules to the flier's advantage but does not find any questionable loopholes. For example, pod-and-boom construction is out; yet the thin rear of the fuselage, with long dorsal fin, will be classified as normal fuselage construction.

The plans may be scaled up for A/2 or for Class A. Make a ruler using the scale shown on the plan. Under the new rules, Classes A and B will compete as one class, although the B model must carry two dummies rather than one. A small three-view drawing is provided to assist in scaling up to the A job. The A ship would be approximately 50% larger; its area, however, would be in the neighborhood of 475 sq. in., which would work out for a loading of about 8 oz. per sq. foot. Another factor in increasing the size of the Half A Atlas is the fact that dummy weights have been increased to 3 oz. this year, so that the gross weight of ship and dummies is about 8 oz. The new dummy, incidentally, is only 3" high, rather than 4 as last year. The height from base to shoulder is 2-1/4", the width



Though a cabin design, fuselage profile allows performance approaching that of a pylon. Dorsal fin compensates for slimmed down fuselage with its concentrated forward area. Powered by K & B .049 shown, ship takes Cub, Wasp, Spitfire, Spitzy.

1-1/2", and surmounting the whole a *head* which is a 3/4" cube.

In the *Atlas* we went all out to make a model that is clean and a little larger than the average 1/2A. While the wing is not the thinnest that we have used, it still isn't the thick type. We used the single wheel to cut the drag of the landing gear in half. The fuselage construction is cut to the bone and yet maintains some scale appearance. The long tail moment arm was used to get the weight as far forward as possible and to get the nose short, which has made the model easier to adjust.

We used the cabin to raise the wing location as high as possible and lowered the thrust line, so we would get the pylon effect that has helped all of us so much in competition. The entire cabin was covered with celluloid. (On the A job, use heavy celluloid.) This is one way to avoid the holes that always seem to be punched in when the meet is at its peak. A large leading edge, while it is a little more work, is well worth the effort when the model has to cut its way through the brush on landing. Solid tips were used for the same reason.

Directions. The fuselage is begun with the laying out of the crutch. The upper part of the body is built up in this crutch. To this the firewall is added. Cut out the bottom keel and cement it in position. The top can now be made by adding the side 1/8" x 1/4" strips as shown on the plan. To the top of these, add the 1/8" sheet wing rest making sure that this is cemented well in place. The rear top 1/8" x 1/4" strip is cut and cemented in place at the back of the cabin. Strengthen it with the uprights that are cut from the same size wood. The entire cabin can be covered with celluloid, and the wing pegs can be cemented in place. Do this thoroughly as they are under a strain when the wing hits in a crack-up. Cut out the door and build a frame, recovering it with the celluloid that was just cut out. Hinges can be made from bandage. A bent pin will hold the dummy in place.

The wing is next. The leading edge is roughly carved to shape. It is easier to build the wing in one piece, if the construction is laid out, cementing in the ribs with the exception of the ones that come at the dihedral joints. After the wing is dry, sand the leading edge to conform to the wing section. When that has been done, the wing can be cut at the dihedral breaks and the gussets added. These are cut out of sheet balsa and trimmed to follow out the wing section. Rough out the tips first, and then cement them in place. Sand the tips to the tip rib outline finishing off the wing with a smooth sandpaper.

The stabilizer is made in the same manner as the wing; however, there is no dihedral, and there are two center ribs that are used to sandwich the rudder in position. The rudder is cut out of sheet balsa, sanded, then cemented in place, making sure that it is straight. It will be necessary with the one wheel design to use skids which are added to the stabilizer tips. (See these on the plan.)

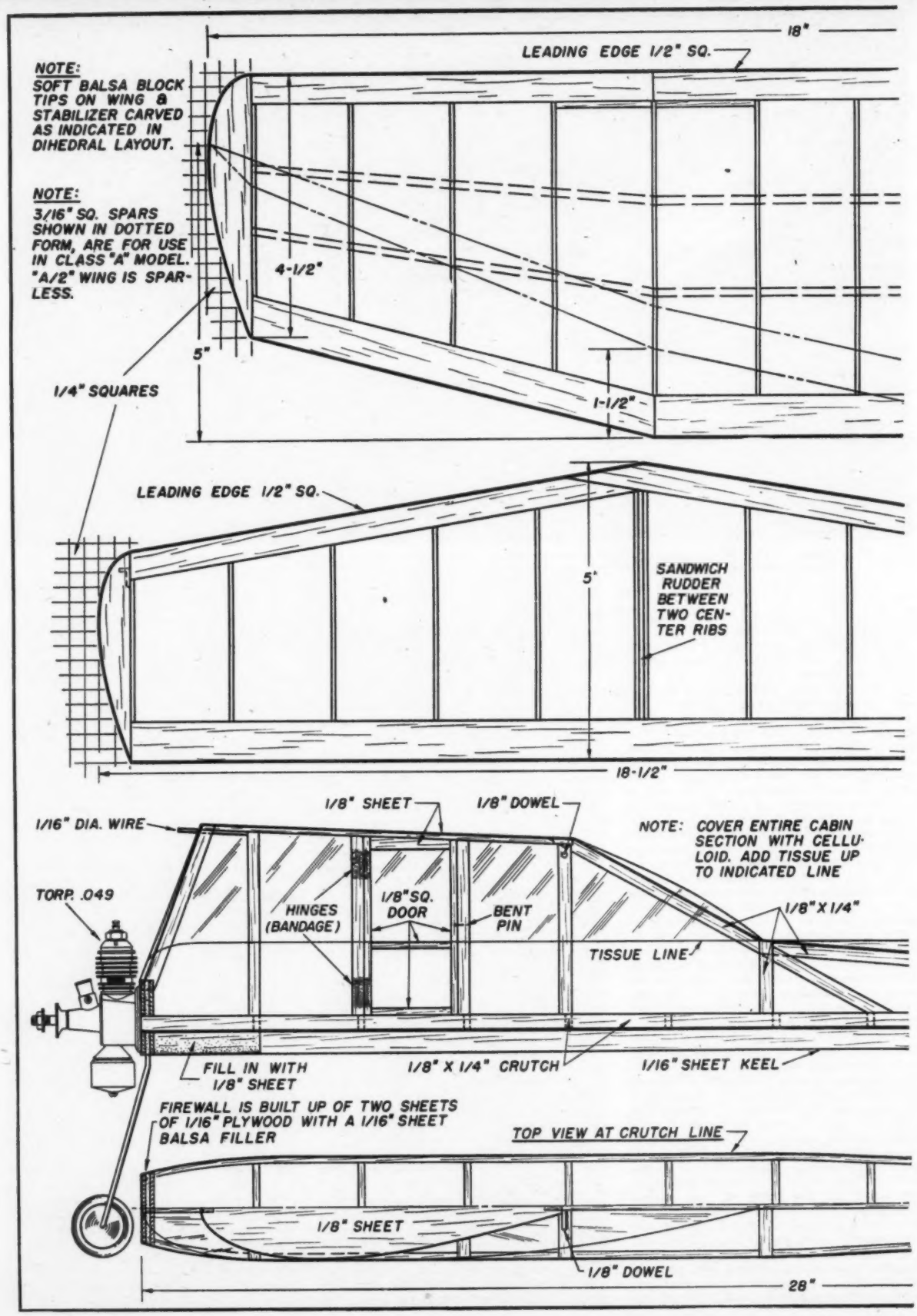
Sand the entire model. This is the best way to get a good covering job. Be sure that no cement joints have been weakened; if so, recement them. We covered the model with light tissue as this is where weight can be saved. The model was not painted with colored dope. It was dyed to save weight. *Trim Film* was used to trim the model. The model was sprayed, using a 39¢ hand spray. Be sure that the dope is not the kind that will pull the covering and the frame out of shape. Warps insure that the model will fly the way it wants to, not the way you want it to. A little castor oil added here to the dope prevents warpage.

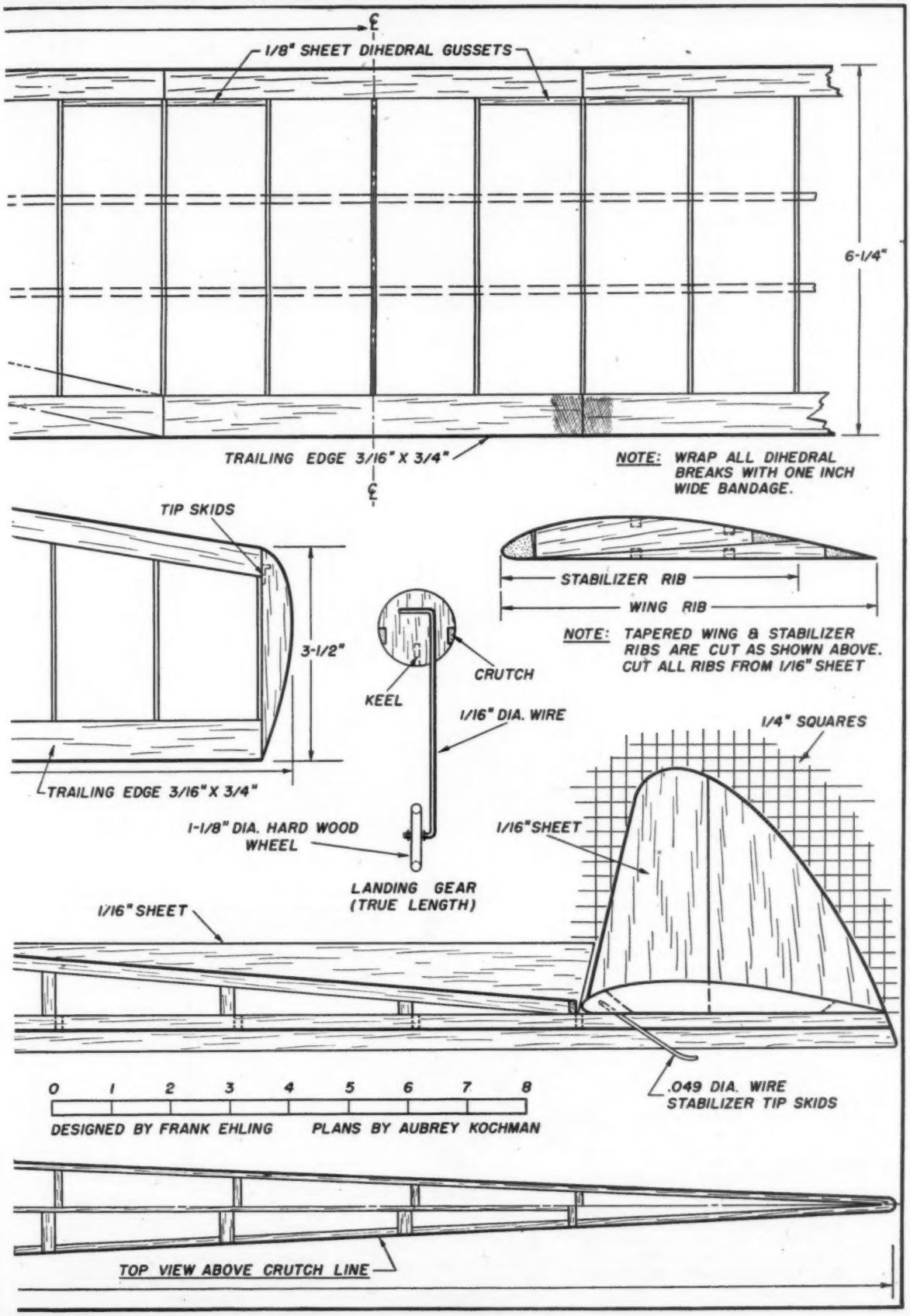
It is impossible to say exactly how much castor oil to add to the dope, because different kinds of dopes require varying amounts of this plasticizing agent. The best test is to brush your plasticized dope on a square of your covering material. If the material curls up when the dope dries, add more castor oil. Keep adding oil until the material remains flat when dry. Of course, it is assumed that the first several coats of dope are not plasticized. On Jap tissue we use five coats of dope, thinned out with thinner to the ratio of 75% dope and 25% thinner. The final coat should be the one with the castor oil added. Incidentally, well doped and plasticized Jap tissue is quite strong. It is important to use some light tissue, such as *Sky Sail*. Although plasticized dope is used on wing and tail to prevent warpage, it should not be used on the fuselage where maximum rigidity is required to prevent deflection under load, especially in high wind.

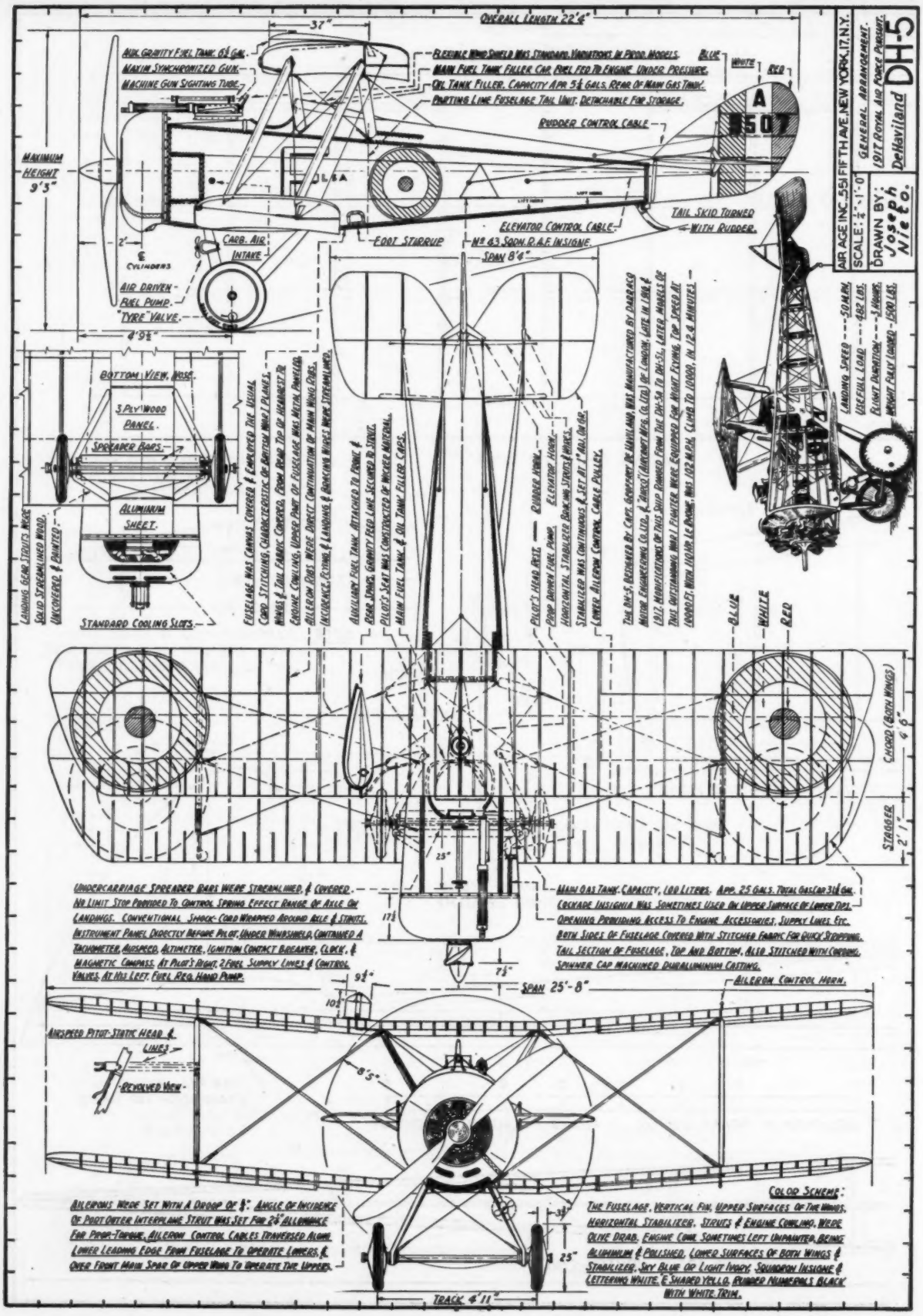
Flying the model is no harder than talking about it provided, however, that you have someone to chase it! Put the dummy in place and hand glide the model. It is a good sign if there is a slight indication of a stall, as that will keep any model from spinning in. Start the engine, and with a short power burst 4 to 6 sec., launch it into the breeze, *not wind*. Observe how the model flys. All that can be said is that it should climb to the right, as a pylon tends to do, and glide to the left. However, if it is flying to the left and gliding to the right, let it go at that. It will be wise to be sure that the model can take off, as it will with the right engine and a good prop. A *6"D 3"P* is the best, we found. Be sure to balance the prop. A few coats of colored dope will help the balancing. *Atlas* is capable of flights exceeding 2 min.

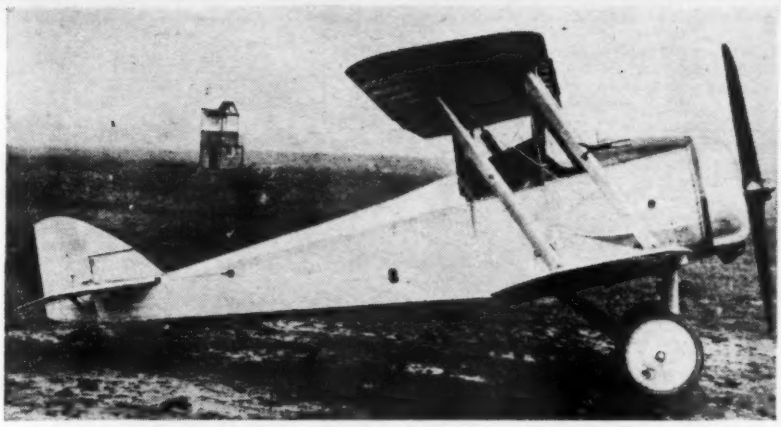
The fellows who have that big bench and ample wood can make a nice A job. All wood sizes are doubled, but use 3/32" sheet ribs. Be sure to use heavy celluloid

(*Turn to page* 55)


NOTE:
SOFT BALSA BLOCK TIPS ON WING & STABILIZER CARVED AS INDICATED IN DIHEDRAL LAYOUT.
NOTE:
3/16" SQ. SPARS SHOWN IN DOTTED FORM, ARE FOR USE IN CLASS "A" MODEL. "A/2" WING IS SPARLESS.
18"
LEADING EDGE 1/2" SQ.
4-1/2"
5"
1-1/2"
1/4" SQUARES
LEADING EDGE 1/2" SQ.
5"
SANDWICH RUDDER BETWEEN TWO CENTER RIBS
18-1/2"
1/16" DIA. WIRE
1/8" SHEET
1/8" DOWEL
NOTE: COVER ENTIRE CABIN SECTION WITH CELLULOID. ADD TISSUE UP TO INDICATED LINE
TORP. .049
HINGES (BANDAGE)
1/8" SQ. DOOR
BENT PIN
1/8" X 1/4"
TISSUE LINE
FILL IN WITH 1/8" SHEET
1/8" X 1/4" CRUTCH
1/16" SHEET KEEL
FIREWALL IS BUILT UP OF TWO SHEETS OF 1/16" PLYWOOD WITH A 1/16" SHEET BALSA FILLER
TOP VIEW AT CRUTCH LINE
1/8" SHEET
1/8" DOWEL
28"

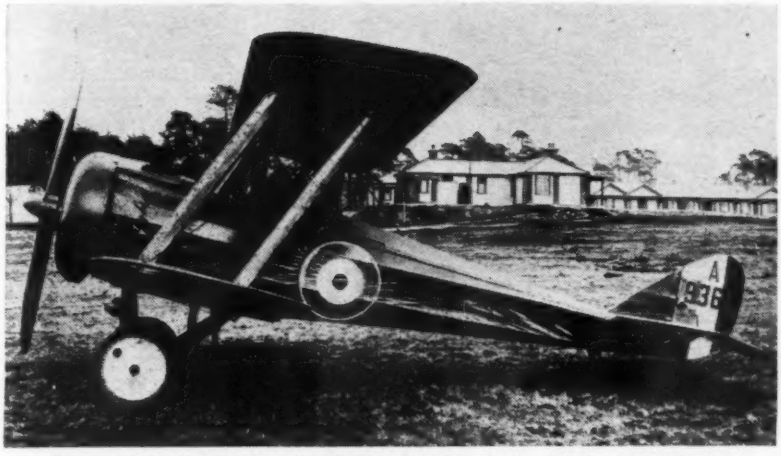

1/8" SHEET DIHEDRAL GUSSETS
6-1/4"
TRAILING EDGE 3/16" X 3/4"
NOTE: WRAP ALL DIHEDRAL BREAKS WITH ONE INCH WIDE BANDAGE.
TIP SKIDS
3-1/2"
TRAILING EDGE 3/16" X 3/4"
STABILIZER RIB
WING RIB
NOTE: TAPERED WING & STABILIZER RIBS ARE CUT AS SHOWN ABOVE. CUT ALL RIBS FROM 1/16" SHEET
CRUTCH
KEEL
1/16" DIA. WIRE
1-1/8" DIA. HARD WOOD WHEEL
LANDING GEAR (TRUE LENGTH)
1/4" SQUARES
1/16" SHEET
1/16" SHEET
0 1 2 3 4 5 6 7 8
.049 DIA. WIRE STABILIZER TIP SKIDS
DESIGNED BY FRANK EHLING
PLANS BY AUBREY KOCHMAN
TOP VIEW ABOVE CRUTCH LINE


DH-5
de Haviland
1917 ROYAL AIR FORCE PURSUIT.
GENERAL ARRANGEMENT.
DRAWN BY: Joseph Nieto.
SCALE: 1/4"-1'-0"
AIRAGE INC. 551 FIFTH AVE. NEW YORK, 17, N.Y.
OVERALL LENGTH 22'6"
SPAN 25'-8"
SPAN 8'4"
TRACK 4'11"
CHORD (BOTH WINGS) 4'6"
STAGGER 2'1"
MAXIMUM HEIGHT 9'3"
LANDING SPEED ---50 M.P.H.
USEFUL LOAD ---482 LBS.
FLIGHT DURATION---3 HOURS.
NORMAL FULLY LOADED - 1500 LBS.
BLUE
WHITE
RED
A 3507
STANDARD COOLING SLOTS.
ALUMINIUM SHEET.
SPREADER BARS.
3 PLY WOOD PANEL.
BOTTOM VIEW, NOSE.
CARB. AIR INTAKE
AIR DRIVEN FUEL PUMP.
"TYRE" VALVE.
TAIL SKID TURNED WITH RUDDER.
ELEVATOR CONTROL CABLE.
FOOT STIRRUP
RUDDER CONTROL CABLE
AIR GRAVITY FUEL TANK 63 GAL.
MAXIM SYNCHRONIZED GUN.
MACHINE GUN SIGHTING TUBE.
FLEXIBLE WIND SHIELD WAS STANDARD. VARIATIONS IN PROD. MODELS.
MAIN FUEL TANK FILLER CAP. FUEL FED TO ENGINE UNDER PRESSURE.
OIL TANK FILLER. CAPACITY APP. 5½ GALS. REAR OF MAIN GAS TANK.
PARTING LINE FUSELAGE TAIL UNIT. DETACHABLE FOR STORAGE.
No 63 SQDN. R.A.F. INSIGNIA.
ANEMOMETER
ALTIMETER
COMPASS
PILOT'S HEAD REST
PROP. DRIVEN FUEL PUMP
HORIZONTAL STABILIZER BRACING STRUTS
STABILIZER WAS CONTINUOUS & SET AT 1° ANGLE OF INCIDENCE
LOWER AILERON CONTROL CABLE PULLEY.
AUXILIARY FUEL TANK ATTACHED TO FRONT
REAR SPRING. GRAVITY FEED LINE SECURED TO STRUT.
PILOT'S SEAT WAS CONSTRUCTED OF WICKER MATERIAL.
MAIN FUEL TANK & OIL TANK FILLER CAPS.
RUDDER HORN.
ELEVATOR HORN.
FUSELAGE WAS CANVAS COVERED & ENCLOSED THE VISUAL CARB. STITCHING, CHARACTERISTIC OF BRITISH WW I PLANES.
WINGS & TAIL FABRIC COVERED. (SOME REAR TIP OF HORNETT IN ENGINE COWLING, UPPER PART OF FUSELAGE WAS METAL PANELED.
AILERON PIVOT WERE DIRECT CONTINUATION OF MAIN WING RIBS.
INCIDENCE, GETTING & LANDING & BRACING WIRES WERE STREAMLINED.
LANDING GEAR STRUTS WERE SOLID STREAMLINED WOOD. UNCOVERED & PAINTED.
THE DH-5 DESIGNED BY CAPT. SCHOLEFIELD DE HAVILAND, WAS MANUFACTURED BY DARRACQ MOTOR ENGINEERING CO. LTD. & ZANCO (AIRCRAFT MFG. CO. LTD.) OF LONDON. LATE IN 1916 & 1917. MODIFICATIONS OF THIS SHIP PROVED FROM THE DH-5a TO DH-5j. LATER MODELS OF THIS OUTSTANDING WW I FIGHTER WERE EQUIPPED FOR NIGHT FLYING. TOP SPEED AT 10000 FT. WITH 110 HP LE RHONE, WAS 102 M.P.H. CLIMB TO 10000, IN 12.8 MINUTES.
UNDERCARRIAGE SPREADER BARS WERE STREAMLINED & COVERED. NO LIMIT STOP PROVIDED TO CONTROL SPRING EFFECT RANGE OF AXLE ON LANDINGS. CONVENTIONAL SHOCK-CORD WRAPPED AROUND AXLE & STRUTS.
INSTRUMENT PANEL DIRECTLY BEFORE PILOT, UNDER WINDSHIELD, CONTAINED A TACHOMETER, AIRSPEED, ALTIMETER, IGNITION CONTACT BREAKER, CLOCK & MAGNETIC COMPASS. AT PILOT'S RIGHT 2 FUEL SUPPLY LINES & CONTROL VALVES. AT HIS LEFT, FUEL REG. HAND PUMP.
MAIN GAS TANK CAPACITY, 100 LITERS. APP. 25 GALS. TOTAL GAS CAP 31½ GAL.
COCKADE INSIGNIA WAS SOMETIMES USED ON UPPER SURFACE OF LOWER TOP.
OPENING PROVIDING ACCESS TO ENGINE ACCESSORIES, SUPPLY LINES ETC.
BOTH SIDES OF FUSELAGE COVERED WITH STITCHED FABRIC FOR QUICK STRIPPING.
TAIL SECTION OF FUSELAGE, TOP AND BOTTOM, ALSO STITCHED WITH CORDING.
SPINNER CAP MACHINED DURALUMINUM CASTING.
AILERON CONTROL HORN.
AIRSPEED PITOT-STATIC HEAD & LINES
REVOLVED VIEW
AILERONS WERE SET WITH A DROOP OF ⅛". ANGLE OF INCIDENCE OF PORT OUTER INTERPLANE STRUT WAS SET FOR 2½° ALLOWANCE FOR PROP-TORQUE. AILERON CONTROL CABLES TRANSFERED ALONG LOWER LEADING EDGE FROM FUSELAGE TO OPERATE LOWERS, & OVER FRONT MAIN SPAR OF UPPER WING TO OPERATE THE UPPER.
COLOR SCHEME:
THE FUSELAGE, VERTICAL FIN, UPPER SURFACES OF THE WINGS, HORIZONTAL STABILIZER, STRUTS & ENGINE COWLING, WERE OLIVE DRAB. ENGINE COWL SOMETIMES LEFT UNPAINTED, BEING ALUMINUM & POLISHED. LOWER SURFACES OF BOTH WINGS & STABILIZER, SKY BLUE OR LIGHT IVORY. SQUADRON INSIGNIA & LETTERING WHITE. & SHADED YELLOW. RUBBER NUMERALS BLACK WITH WHITE TRIM.



Nothing like the back-staggered de Havilland had been seen before the DH-5. Pilots regarded it a freak, quickly changed their minds. In a later day Beech used reverse stagger.

WORLD WAR I



Prototype DH-5 directly above had flat-sided fuselage, fairing behind engine, balanced rudder; production version (top) had hexagonal fuselage cross section. Ship was sturdy.

THE DH-5

by ROBERT C. HARE

OF THE 12 military designs by Geoffrey de Havilland produced during World War I by the Aircraft Manufacturing Company, only two were single seat fighters. These *Airco* machines were the *D.H.2* and *D.H.5*.

Model *D.H.2* was a pusher fighter, developed from the two-place *D.H.1*. This little ship was developed early in the war as a countermeasure to the death-dealing *Fokker E.I* monoplane, whose synchronized machine gun gave the Germans an edge over Allied aviation in 1915. The *D.H.2* carried a forward-firing .303 calibre machine gun which was at first movable but later fixed.

Once it got into action against the *Fokker E.I*, the advantages of the *D.H.2* became obvious. First. the *D.H.* was capable of better performance; second, it was not troubled with frequent failures experienced with the Fokker synchronizing gear; and third, its visibility was far superior to that of the German ship.

As a result, it wasn't long before the *Fokker* was pretty effectively neutralized by the *D.H.2*, and the advantage of the *Fokker* synchronized gun system was overcome.

As soon as the British developed a satisfactory synchronizing gear, de Havilland designed the *D.H.5*. This was late in 1916. While other single seat scouting aircraft were pressed into service by the addition of a synchronized machine gun, the *D.H.5* probably was the first original British design specifically developed to take advantage of the new weapon.

Design considerations. In laying down lines for the *D.H.5*, Geoffrey de Havilland made a serious effort to preserve those characteristics which had made the *D.H.2* such a satisfactory airplane and at the same time improve on its performance.

Final configuration of the *D.H.5* resulted in a back-staggered biplane in which the pilot was placed in front of the leading edge of the upper wing, giving him an unusual range of vision forward and upward. Sitting directly over the lower wing, his visibility straight down was nil, but reasonably good over the leading or trailing edges.

Improvement in performance was accomplished by use of a 110 hp Le Rhone rotary engine, an increase of only 10 hp over the powerplant fitted in the *D.H.2* pusher, and by clean lines. Roundness of the engine cowling was developed into a hexagonal cross section aft of the cockpit by a series of formers and stringers. This method is often used by model builders today and has the advantage of reasonable efficiency without the difficulty of monocoque construction.

Resistance was further cut by careful streamlining of interplane struts and the use of *RAF* wire rigging.

A high maneuverability factor was obtained by use of large elevators and rudder, and by including large ailerons in both wings; and by generally compact design.

The resulting *D.H.5* was therefore smaller, faster by a good margin, more maneuverable, and only slightly heavier than its pusher predecessor. When the prototype *D.H.5* first appeared, there was admittedly some doubt as to the soundness of the back-staggered design. Nothing like it had been seen before, especially in an airplane supposed to be a single seat fighter. Many pilots regarded the *D.H.5* as a freak—but they should have known better, knowing that its designer was de Havilland.

Performance. There was some talk that the lower wing would fold up in a dive. Other pilots thought the upper wing would blow away. But when they all had their turn in the *D.H.5* and saw just what the little ship would do, they changed their minds.

They found the *D.H.5* had a top speed (official figures) of 109 mph at sea level with full military load. At 6,500′ it stepped along at 105 mph; 102 mph at 10,000′ and 89 mph at 15,000′. Its initial rate of climb was about 1,000 fpm; it reached 10,000′ altitude in slightly over 12 min., but required 27-1/2 min. to get to 15,000′. Its service ceiling was 17,000′.

There weren't many ships, if any, of the same power, that equalled this performance in late 1916 when the *D.H.5* came out of the shops.

Normal landing speed of the *D.H.5* was 50 mph at sea level, slightly on the "hot" side for that period. It would slow down quickly once on the ground, and could be operated from a relatively small field. On take-off, it accelerated rapidly and was airborne in less than 100 yards.

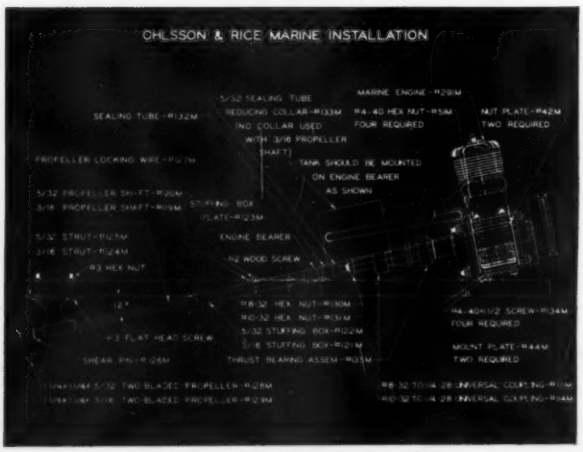
Flight Characteristics. If pilots at first doubted the practicability of the design itself, they must have had some doubt about the ability of the *D.H.5* to show a good operational performance. Certainly, the airplane had its little idiosyncracies —as do all airplanes for that matter—but when they got to know the ship, pilots liked the *D.H.5* and felt pretty secure in it. (*Turn to page* 44)

O & R marine .29

Of interest to all model engine users is this sturdy .29 marine powerplant, entirely new, with many special features.

THE O & R *Marine* .29 is a high speed version of the .29 aircraft model. A flywheel on the front makes easy starting by winding a starting cord around the groove without stringing through under the propeller shaft, as in the past. Starting in small high speed, marine racing engines have always been troublesome when converted from aircraft to marine. The mixing valve-adjusting nut and the fuel line are located in the rear clear of the flywheel and exhaust, convenient for adjustment. The *Marine* engine has a ball bearing thrust, different from the airplane version since the *Marine* is a pusher. The ball thrust, totally enclosed for trouble-free operation, is located against the main journal bushing on the engine exterior. Part of the standard equipment is the O & R Universal Coupling, facilitating mounting, making up for misalignment of installation, flexing of the boat and shaft, reduces vibration. Couplings are available in 15 thread sizes. Ball Bearing Thrust and Universal Coupling, flywheel, screws, nuts and bolts come in rust-resistant gun-metal blue finish. The blue anodized aluminum cylinder head indicates displacement. The crankcase is a burnished aluminum die casting.

A main feature is the crankshaft arrangement, allowing full floating flywheel shaft with counterweights, resulting in smooth operation due to two counterweights on either side of the connecting rod. This almost perfectly balances counterweight and reciprocal forces. The *Marine* engine has a drop-forged steel connecting rod with floating lower end journal bushing. The *Marine* is a much higher speed engine than the O & R aircraft engine due to new piston design. This piston has a hardened steel sleeve, supported by a cast aluminum inner piston which carries wristpin bosses. The under side of the piston head has waffle cooling fins to keep piston head temperature low and to strengthen the cylinder head itself. As in all O & R engines the fittings and tolerances in piston and main journals were designed specifically for O & R *No. 2* fuel. Compression ratio and fuel are balanced for the O & R Racing Plug. To follow is a full line of L & R *Marine* accessories as, various lengths of threaded shafts, shaft stuffing boxes for twelve degree mounting, struts, and various pitches and diameters of two and three bladed bronze propellers. A *Marine* engine that can actually be mounted in a manner befitting marine installations, with necessary accessories will open up new horizons of model enthusiasm in marine racing.



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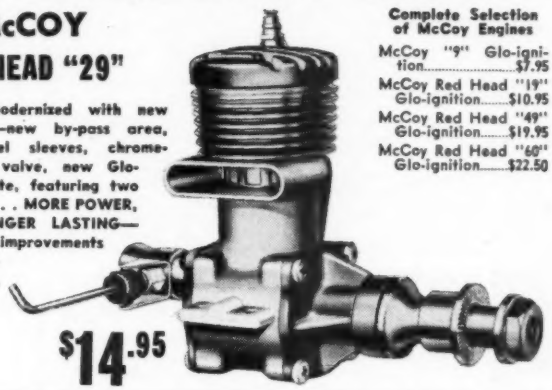

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Freshman 29	3.98
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Baby Era	2.50
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Baby TC-3	1.98
Cessna 170	1.95
Firebaby	2.50
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Piper Cub	1.95
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Scout	2.25
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Wing Dingus	2.00
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¾x24 racing	
O&R High Glow Plugs	.85
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McCoy Rt. Angle Jet	.50
McCoy 19 Radial Mount	.35
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Veco Props	.35
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Hap—The Pilot	.50
Ace—The Race Pilot	.60
Veco Wheels (Pr.): Airwheels 2½" $3.00, 3½" 3.50, 4½" 4.50, Semi-Pneumatic—2" 95c, 2½" 1.10, 3" 1.50, Streamline—1⅞ 50c, 2⅜" 65c, Balloon Sponge Wheel—⅞" 25c, 1⅛" 30c, 1⅜" 35c, 1½" 35c.	

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Dremel Moto-Tool #1	17.50
Dremel Moto-Saw	5.85
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REPORT FROM THE WEST

by Jim Saftig

WE HAD a bit of a gab-fest with Bob Enright and Tac Cummins the other day on one of our jaunts to Los Angeles. It seems that the makings of another good U-control contest is underway. The *Burbank* Model Club is planning to hold a very novel type of meet that gets our stamp of approval. One type of flying will consist of team streamer chasing that should prove very interesting. In this event, two teams consisting of two men each will fly at the same time. The ships of one team will have yellow streamers about 4' long with a 1' strip of red streamer next to the ship as a safety factor. The other team will have blue or some other color streamers with the 1' red streamer next to the ship. The idea of the contest is to clip the streamer colors off your opponent's ship down to the red strip without losing your own tail feathers. Once a ship has been cut down to the red, that pilot must land his ship (via the fuel shut-off as per team racers), and the contest goes on until both of the opposing ships are downed. The winners continue opposing other teams until the top duo comes out victorious. Spectators and contestants alike should be on edge all of the time this type of flying is in progress. What happens when someone takes off 14" of that one foot red ribbon? Should be interesting. Hi Johnson and Bob Enright are the lads behind this idea. This same contest will promote a little different and much improved type of individual stunting. The contestant will take off and execute one maneuver each of the *A.M.A.* pattern, and then may cut loose and go wild. Anything that he wishes to try is OK with the judges and spectators. The flyer who puts on the best show will be judged the winner.

* * *

Arthur "Red" Everitt, Mechanical Design Engineer for the *Navy*, has come up with one of the finest Wakefield models we have ever had the pleasure of seeing. This model is proportionately similar to Ron Warring's sharp model, and he has incorporated approximately the same balance ideas of Warring, but from there on, Everitt took over. Pertinent facts about the ship are as follows: Wing area 208 sq. in., stabilizer 63 sq. in. The section is the very popular *R.A.F. 32*. The box-type fuselage, with diagonal inset stingers, carries the retractable gear. We noted that the propeller was extremely well designed and is the apple of Everitt's eye. This phenomenal design has been incorporated into a few of the top notch flyer's ships, and reports have been very good. Dick Everett, prominent rubber man (no relation), has a few quotes to make about Red's model. "I have never seen a rubber model fly as long as his will consistently. His prop is by far the best design I have ever seen. I won the Nationals with his prop design. I don't believe there is a man in the country who can touch him, and he still isn't satisfied." These are quite positive statements, and they come from one of the best rubber modelers in the country. We have seen this ship consistently turn in flights of over 4 min., and there were no thermals. It weighs just over 8 oz. We are betting Finland isn't going to keep that mug for the third year!

Another of Red Everitt's ships that we though you would like to hear about is his unorthodox twin counter rotating prop job. These propellers are 14" in diameter, with the rear driver having 17% more pitch than the front one. The ship has the *R.A.F. 32* section and has the plug in type wing. Another of the unusual features is the stabilizer which is of the butterfly design. The stab area is 76 sq. in. and has 105° of dihedral. This eliminates the rudder need. The fuselage is perfectly round in design

Harvey Patton and *Arden* .19 rc job.

and incorporates twin folding wheel gear. For power, the ship carries two motors of *T* 56 rubber (10 strands each) which are 36" long. Many successful flights have been made though adjustments are a bit critical due to the fact that the ship is of mid-wing design. This is going to be remedied in the near future as Everitt is re-designing and will move the wing to the top of the fuselage. The model was built strictly as an experiment for the counter rotating propellers, which completely eliminate all adjustments for side thrust. Red tells us that 10 strands allow him to really pack the winds in and feels that the results are worth noting.

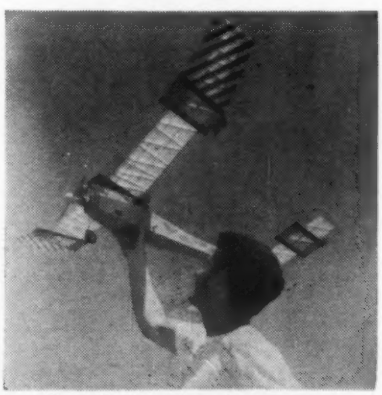
* * *

The *San Diego Aeroneers* recently held a meeting to discuss how the club would like to see the Wakefield eliminations conducted. This is what was decided. Each club wishing to compete would hold an elimination meet to pick the five best men. These flyers would be sent to a semi-final elimination which would be held at the most central location of an academy district. The winners here would go to the finals in Olathe, Kansas, where a two-day meet would be held under conditions as nearly like those that will be encountered in Finland. The meet would be held very early in the morning or late in the evening. Enough timers should be on hand so that most of the ships could be in the air in the shortest possible amount of time. In this way all flights could be completed before thermals start popping up. There it is in a nutshell. What do you think of this club's ideas?

* * *

We received a very informative letter from Tom Moore, Secretary of the *Northern California Free Flight Council*, about some of the aims of the Council. It seems that free-flight has been a bit stagnant up North as none of the clubs have had enough money to put on a series of meets each year. Consequently, the flyers have found it necessary to band together in order to stage contests. Four cooperative meets are

(*Turn to page* 43)



Denny Davis, with payload *Paagan*.

MODEL KINX

Here are some short cuts to better modeling

FIG. 1—When cutting out bulkheads, wingtip formers, etc., especially from thick or soft sheet balsa, always cut well outside the line with your saw. Trim down to shape with a keen razor blade and/or sandpaper. Cutting right on the line always results in undersize fits.

Fig. 2—For real strength of vital joints always double glue. Place cement on the surfaces of the joint and allow to dry. Then put more cement on the proposed joint and press the parts together. Some expert builders make an entire model, joint by joint, in this fashion. Immense strength and lack of warps is the result.

Fig. 3—Tapered wings need not be a source of envy. Ribs that fit properly without dips and bumps in the covering are made easily. One method (A) shows two templates, one for the root rib and the other for the tip rib. Make these templates of ply or metal, and drill two holes through each, so that the templates may be bolted together in their correct relative position. By placing the proper number of sheet balsa blanks between the templates, and the use of a sanding block, you can turn out automatically a full set of precise ribs. A second popular method (B) shows how all ribs are at first cut similar to the root rib. Then, one rib at a time, each is cut out by measuring in from the trailing edge the proper length of the rib in question. This point is connected as shown with a straight line to the bottom of the leading edge. (Also good for making tapered wing tips, as on free flight contest jobs.)

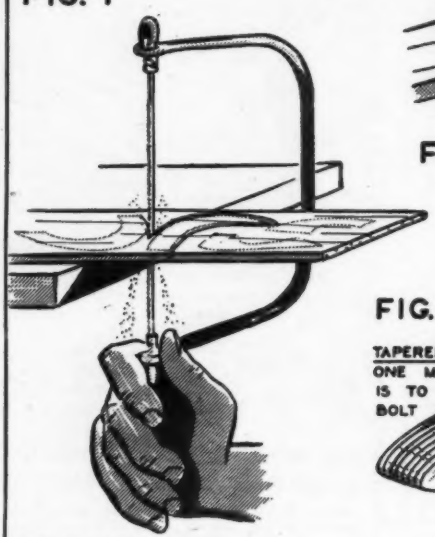
Fig. 4—One of the toughest of all modeling jobs is making an accurate windshield for sport and flying scale models. Since individual models vary, even though made from the same plans, patterns always seem to go haywire. Make trial windshields from heavy typing paper and pin in place. When you have the right fit, use the paper pattern to cut out your celluloid windshield. For the common type shown, begin by cementing the windshield along the leading edge and at one point (the center) on top of the cowling.

Fig. 5—How can you bend loops, etc. in heavy music wire? Simple! Clamp a short length of heavy wire, rod, or an old drill in a vise. Then holding the wire to be formed in both hands, wrap it around the upright rod in the vise. Select a rod of the proper diameter for the bend desired; if not available, make the worst part of the bend around the rod and then complete with appropriate heavy pliers, squeezing the loop down to size.

Fig. 6—To prevent warps "plasticize" the last coat of dope on your covering. This can be done by mixing three to six drops of castor oil in a 2 oz. quantity of dope, or in proportion thereto.

Drawings by Bruce Wennerstrom

FIG. 1



CUT SLIGHTLY OVERSIZE WITH SAW, THEN SAND TO LINE.

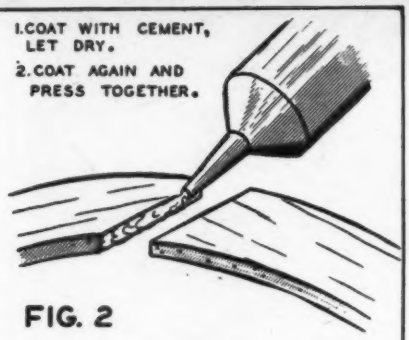
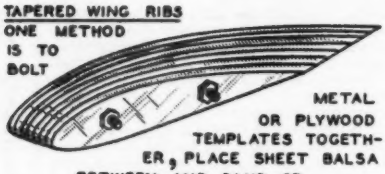


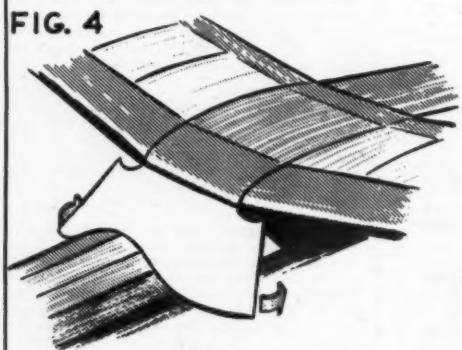
FIG. 2

FIG. 3



MARK OFF RIBS FROM ROOT RIB.

FIG. 4



WINDSHIELDS. TRIAL FIT STIFF PAPER PATTERN & TRIM TILL RIGHT.

FIG. 5

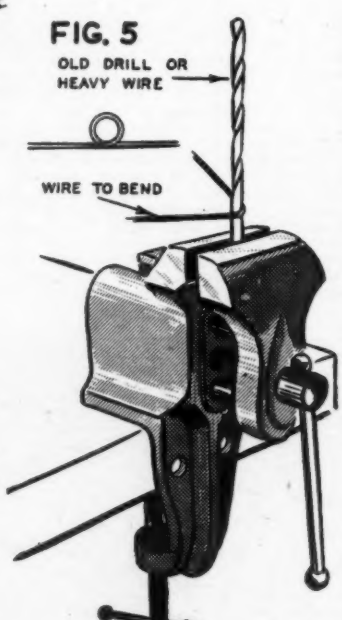
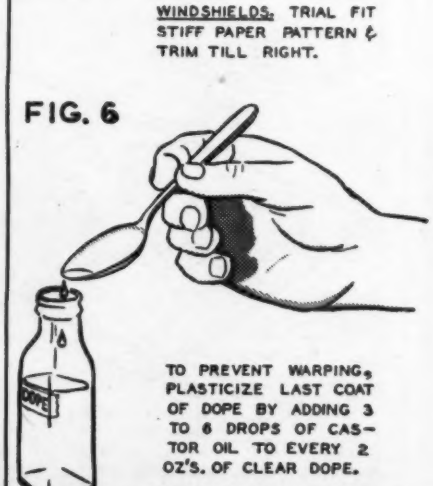


FIG. 6



TO PREVENT WARPING, PLASTICIZE LAST COAT OF DOPE BY ADDING 3 TO 6 DROPS OF CASTOR OIL TO EVERY 2 OZ'S. OF CLEAR DOPE.

(*Continued from page 41*)

planned for '51 with the Council clubs dividing the costs and profits if any. So far the profits have been very lean but the clubs are at least holding their own. They have no sponsors, have asked for no donations, and so far are doing OK. The entry fee to the Council is $2.00 which is used for stamps, etc. This entitles each club to one vote although it may have two representatives at each Council meeting. So far, three meets have been held, two at Sacramento and one at Tracy. Each had a different Contest Director and head timer. Any Council member with a club entry may let its members fly one ship in each class at no cost to the individual flyer, as his club has paid for his entry in advance plus the effort of setting up and running the contest. Each club must furnish two timers and their relief throughout the day so that the meet will operate smoothly. The other work is evenly divided so every club member will have a chance to fly during the contest, and so far, the cooperation has been excellent. Up to now, it has not been possible to include merchandise with the trophies but it is thought that this may be changed in 1951. A rubber event was included in the last scheduled meet, and while there wasn't too much offered as awards, there was quite a turnout. Future contests will include rubber if possible. It is sincerely hoped that more clubs will join this Council which so far consists of the following: Sacramento Skyoneers, North Sacramento Free Lancers, San Francisco Vultures, San Leandro Line Twisters, Oakland Cloudusters, Elmhurst Prop-Busters, Alameda Prop-Spinners, Stockton Gas Model Association, and the Twin Cities Model Club. At the last meet these clubs held, there were 87 entries and much enthusiasm was shown in the rubber event. John Lenderman handled the C.D. duties and June Dyer did the recording.

• • •

Western Model Distributors held Open House recently, and over 50 dealers from various points in California attended. A pre-Christmas showing of merchandise was on the agenda with dealers and manufacturers alike taking part. From here, it looks like this Christmas should be a dandy for the modelers. With the supply of stock that Ed Kapitanoff and Harry Balaban have on hand, hobby shops should have no wants for the Xmas trade. The get-together was excellent, lunch and refreshments were served.

• • •

Harvey "Pop" Robbers, Secretary-Treasurer of the *Western Associated Modelers*, informs us that Mr. Meryl Severson, of the *Aero Modelers of Alameda*, was appointed as a committee of one to purchase the plaques which will be awarded to the clubs winning the association championship in speed and stunt. Competition has been very keen, and the clubs that win these plaques will be considered the wheels of the year. At this writing, the *Alameda Aero Modelers* are ahead in speed points and the *Stockton Gas Model Association* is out in front with top stunt points. Rules in all W.A.M. meets are very rigid, especially those pertaining to engine displacement. Any entrant at a W.A.M. Sanctioned Contest who uses an engine which is over or under the class displacement limits for the event is ineligible to enter any W.A.M. Sanctioned Contest for six months, and all points, times, and trophies won by him that day are forfeited. When a contestant sets a new speed or new proto record and the displacement of the engine used is questioned by another contestant, a bond of forfeiture amounting to $5.00 is posted with the Contest Director before the engine is broken down. If the displacement of the engine falls within the class in which it was entered, the bond is forfeited to the owner of the engine in question. These binding rules keep the flyers on the "straight and narrow" at all times.

• • •

We thought we might run a couple of ideas now on some of our future thoughts about the *Report From the West* column.

Right quick like, the *West* is going to mean the entire coast and the regions west of the Rockies. We know that amazing things have been happening in free-flight and U-control circles out that-a-way, and we want to help spread the word. It has been our pleasure to see some of the flyers from these areas in action, and they have made plenty of the modelers from the West (and East) sit up and take notice. The rest of the modelers in the nation want to know what is going on in your section of the good old United States. Let's hear about those unusual ships, club activities, trends, etc. Unusual things happen once in awhile when ideas are expressed and elaborated upon. One instance happened a short time ago that gave us a chuckle. A friendly argument came up with two of the free-flight boys about square ships and streamlined jobs. Seems the beef boiled down to a challenge as to which was the better design. Results, the modelers were to each build a ship and compete against one another in a private feud. The very funny part of the whole situation was that in arguing, they had sold each other on the other's design ideas, and when contest day came, these lads had built one another's ideas into his ship. Were their faces red? This story is just one of the reasons we want to get the dope on what's transpiring in model circles all over the West. Some flyers like a hot climb and fast glide, while others prefer a steady climb and slow glide, and so on. What do you like? You club secretaries can get the information to us and the individuals can help out immeasurably, so let's hear from you. Send the info to Jim Saftig, in care of this magazine.

* * *

We ran into Ira Hassad the other evening at the Midget Races. Everyone knows the *Hassad*, *Sky Devil*, and *Blue Streak* engines that Ira developed. You might know he would be at the track and down in the pits with his head under a hood checking on one of the *V' 8's* or *Drakes*. We understand that he has developed another engine, strictly for his own amusement, and the report is that it's a honey. Ira is now working in a machine shop doing government work. Hope to see you out at some of the contests in '51, Ira.

* * *

Out West, activity has been very good with radio control making terrific advances. Rubber, long thought dead, has come back to life and is going great guns. Naturally, the 1/2 A jobs are betting a second wind and are still on the upswing. Team racing is really rolling and many contests are scheduled. From here, everything looks in top shape for a swell season.

The DH-5

(*Continued from page 37*)

One of its most likeable characteristics was its inherent strength and its ability to take punishment in combat. It could be slammed around in the air through violent maneuvers and stay in one piece. Of course, there were some over-anxious pilots who strained the *D.H.5's* structure to the breaking point—something that can be done with any airplane. But generally speaking, the *D.H.5* was as staunch a ship as World War I produced.

Pilots taking off for the first time in a *D.H.5* found they had to get the tail off the ground by pushing the stick forward right away. Rudder control at low speeds was quite ineffective, and to keep the ship straight required constant rocking on the rudder bar. As speed increased and the

rudder took hold, the *D.H.5* pilot eased back on the stick, held it neutral, then at about 65 mph gently rocked back and took off. This gave a fast, low angle climb of about 1000 fpm. In a steep climb the rate and airspeed both reduced to a point that was unsafe.

Once leveled out at altitude, the *D.H.5* was stable but required some flying. Directional, longitudinal and lateral stability were probably normal for that period. Normal precautions required in flying any rotary engined aircraft had to be observed in the *D.H.5*. The ship resisted a roll or turn to the left, rolled or turned very easily to the right. Lateral control was effective and the rate of roll sufficient for the time. It is reported that in some instances a *D.H.5* was liable to tuck under during a steep dive. The ship is reported to have had some other tricks such as stalling without much warning, tending to slip in a turn and tending to drop into a secondary spin if the first were not properly recovered from.

While these characteristics were perhaps no more pronounced than in other ships, *D.H.5's* peculiar configuration added fire to the initial objection of pilots who flew them. But once learning how to handle a *D.H.5*, pilots found them to be pretty reliable fighters. Because of their excellent visibility, they were particularly valuable in close ground support work. Long after they were replaced by pursuits capable of better performance at higher altitudes, the *D.H.5* was retained for "hedgehopping" operations.

D.H.5 Prototype. Every airplane has a prototype—the first flying article—on which evaluation tests are made. The *D.H.5* prototype was almost identical to the production article, but there were several important differences.

In this machine the fuselage structure was of the conventional, flat-sided variety, with flat bottom and rounded, faired top surface. The circular form of the engine cowling was faired into the flat sides of the fuselage through a series of short stringers which terminated at the rear of the cockpit. This section was fabric-covered in spite of the closeness to the engine. A small fuel tank was located in the large headrest behind the pilot.

Rudder of the prototype was of the balanced type—long, low and well rounded. The vertical fin also was very low and long. Rudder control cables entered the fuselage below the upper longerons through leather patches sewn to the fabric.

The illustrations here compare the side elevations of the prototype and a production *D.H.5*, and a sketch of an uncovered fuselage in which can be seen some of the details discussed appears on the drawing.

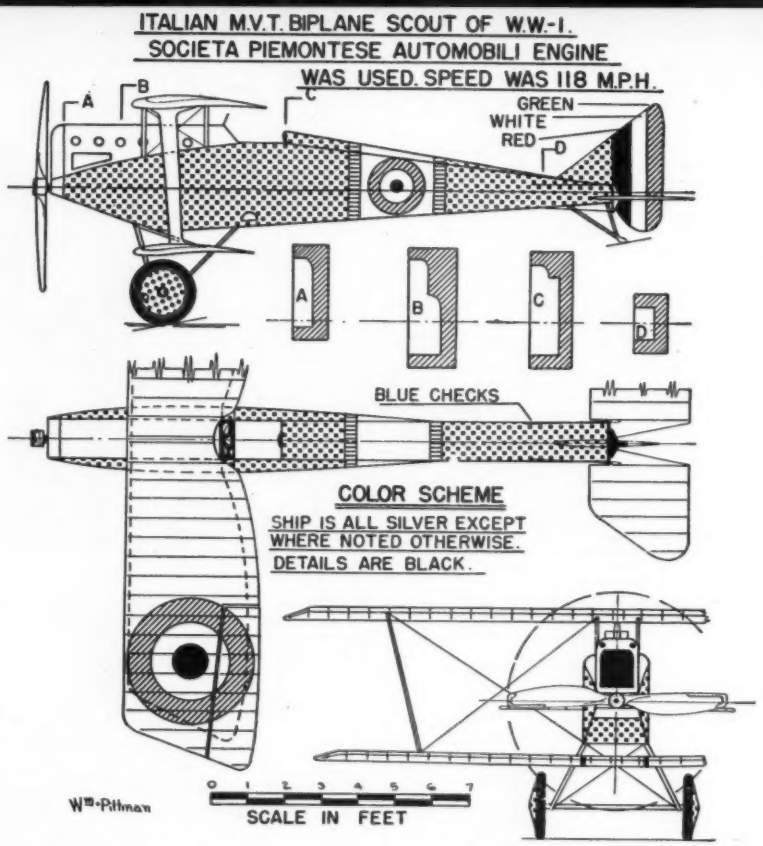
Part two of this article will carry a structural analysis of the production model *D.H.5*.

Scrap Box

(*Continued from page 7*)

A most interesting, and perhaps significant development is the possibilty that control-line flying may be revolutionized. *American Junior Aircraft Co.*'s Jim Walker (1166 NE 31st St., Portland 12, Ore.) has released news, but not details, of a sensational new method of flying, called Air-Line Control. *Victor Stanzel & Co.* (Schulenburg, Tex.) has been pressing the AMA rules committee to admit single-line control to competitive flying, since the wording of current rules automatically rule out a single line. His firm is holding off on larger designs, for Classes A and B, based on the Mono-Line system introduced about a year ago with the small Tuffy kit.

According to Walker, *Air-Line* control will permit the model to be flown almost as a free flight, directly overhead, or in a large circle similar to U-control. The model will be capable of loops, inverted flight, and, among other things, rolls. This latter maneuver is, in itself, a sensational annoucement. Walker states that true proportionate control is obtainable on all surfaces; that there is nothing to get out of order, even after hard landings. It may be available in a variety of forms, sizes and combi-



nations. In addition to the normal elevator control, rudder, engine, and ailerons will be operable.

This system may be used under snow or mud conditions, inasmuch as there will be no movement of the control lines; the lines may be slack without loss of control. Adding to the mystery is the statement that the ship may be flown in circles without the pilot turning around. He can't get dizzy. Details may be forthcoming at the *Model Industry Show* in February.

Re the rolling maneuver, some observers recall that Walker once demonstrated a Fireball that could roll. A large U-shaped piece that fitted outside the outline of the wing permitted the ship to roll about its longitudinal axis without becoming wrapped in its lines. Other experts, however, draw attention to the fact that a single line can be led to a ring placed around the fuselage, so that the ship can roll within the ring. How this would be connected to the controls is not clear. Among the many questions being asked, several stand out: 1—Does Walker intend use of a rotating single line (Walker states that his work on the system dates back to before his first two-line system flights)?; 2—Will the pilot be outside the circle?; and, is a relay type of motor control involved? In connection with the latter it is known that Walker has had success on his own models with a small crankcase hole and clapper valve.

The discussion of the Mono-line system hinges mainly about the comparative strength of one line as opposed to the ordinary two now in use. Stanzel has submitted to the committee a technical paper examining the safety factor of one line vs. two. From an engineering standpoint, Stanzel pointed out, two control lines attached to a pivoted bellcrank act as two fibres of a single line in that each carries one half the load. For example, the combined tensile strength of two .012 diameter music wire lines is about 72 lb. (36 lb. for each line), based on a tensile strength of 300,000 lb. per sq. in. A single .017" line based on the same tensile strength has a tensile strength of approximately 72 lb.

Stanzel states that as loading increases, approaching the breaking point of the 2 lines, it follows that, when one line breaks, the bellcrank pivots and the entire load is shifted to the remaining line with a jolt. The loading on the remaining line is more that doubled and the line gives way. For another example, suppose that one of the two .012 lines has a defective fitting capable of withstanding only one half the tensile strength of one line, or 18 lb. As the pull approaches 36 lb., that fitting will snap. This throws the entire load on the remaining line. This will be the breaking load which, coupled with shock load, will snap the second line. Thus the second line can't be depended upon in case of failure of the first line. If a single line has a tensile strength equal to the tensile strength of two control lines, as in the case of the .017 line and the two .012 lines, the single line is equally safe. The Stanzel method of using one heavy line to transmit torque requires one heavy line, as .016 to .028 in A and B.

by BILL WINTER

Wakefield Cup Contest Rules 1951

1. The competition shall be open to all nations, whose teams shall consist of not more than six individual competitors.
2. The contest shall be for fuselage rubber-driven models, the rubber motor or motors of which must be enclosed, and the fuselage or fuselages must be fully covered with a maximum cross-section which is not less than 65 cm² (10.015 sq. ins.). In straightforward cases the maximum cross-section will be the actual largest cross-section of the fuselage. In complex cases where the intersection between the surfaces and the fuselage is difficult to determine exactly, the maximum cross-section taken will be that lying between the two vertical parallel planes which are tangents to the largest circle which can be inscribed in the largest transverse section of the fuselage.
3. The following conditions must be complied with regarding the area of the surfaces and the weight of the model.
   (a) The surface must not be less than 17 dm (263.5 sq. in.) or more than 19 dm (294.5 sq. in.). The surface to consist of the total surface of the wing(s) and that of the horizontal stabilizing surface(s) measured as the orthogonal projection of the surfaces onto the horizontal plane in their normal flying position.
   In the case of wings or empennages attached to the body of the machine the surface taken will include the complete center of the fuselage(s), the normal contour lines of the surfaces being supposed extended until they meet the plane of symmetry of the machine in plan view.
   (b) No model shall have a total weight of less than 230 grammes (8.113 ozs.).
4. The model, including the propeller(s), must be constructed by the competitor. Gearboxes (when used) must also be constructed by the entrant, with the exception of the gear wheels. Commercial timer units may be employed.
5. Each model must rise from the ground from a standstill, entirely under its own power, transmitted by the propeller(s) and no push is permitted. Models when starting, may only be held by the propeller(s) and by the wingtip. Holding the model for release by any other part shall lead to immediate disqualification from that round.
6. No part of the model shall be become detached during its flight.
7. Models shall be check-weighed prior to each round.
8. Each entrant will be allowed three flights during the contest, the aggregate duration of the three flights to be recorded as the entrants score. An attempt of 5 seconds duration or under will constitute a "no flight" but only three such attempts for each round will be allowed. In the latter event the highest "no flight" time shall constitute the recorded time for that round.
9. In each of the three rounds, five minutes (300 seconds) will be the highest time recorded.
   At the end of the third round any competitors having the maximum score of 15 minutes (900 seconds) shall fly off a fourth round in which no time limit of duration will be imposed.
   In the event of the model being lost or irreparably damaged in the third round a reserve model may be employed for the fly-off.
10. The timing of any flight shall terminate when the model touches some solid object or passes out of the sight of the timekeepers, the timekeepers remaining at the point from which the model is released.
    Two officially appointed timekeepers must be employed, each having an approved stop-watch. The mean value of the reading of the two watches shall be taken as the actual and recorded duration. No binoculars, telescopes or

other magnifying aids shall be used by the timekeepers to observe the model in flight, but colored, tinted, or normal corrective spectacles are permitted.

11. When called by the judges each model must be ready for flight within three minutes or the competitor will be liable for disqualification from that round.
12. Minor adjustments or repairs, but no replacements other than rubber motor(s) and/or propeller(s) may be made between competition flights.

    Repairs or trial flights may only be made with the consent of the judges, and after each repair the model must be reweighed and re-checked and must possess the same characteristics as originally.
13. A competitor entering this competition thereby agrees that he is bound by the regulations herein contained and by any special rules which may hereafter be issued in connection with this competition.
14. The winning nation shall be that which has in its team the individual competitor attaining the highest aggregate duration of flights.
15. The judges' decision shall be final.
16. The winning nation will hold the Cup for one year.

Official News

(*Continued from page 25*)

boys made the other flyers sit up and take notice. A number of them were using a fine steel wire similar to control lines for the towline which actually enabled them to feel thermals lift the model! This probably accounted for some of the perfect releases after towing the model for several minutes. Director Arnulf-Olsen, donor of the magnificent *Swedish Glider Cup*, which symbolizes to model gliding what the *Wakefield* does in the rubber model class, presented the trophy to Stjepan Bernfest of Yugoslavia for a high total time for three flights of 920 sec. (6 min. maximum time limit).

At a meeting of the *International Commission for Model Airplanes* held at Stockholm, Sweden on the 29th and 30th of May last year, regulations were established for the conduct of international precision acrobatic events. The resemblence to our own rules as drawn up by the *Control Line Acrobatic Rules Committee* is amazing. Even the Australian publication, *Australian Model Hobbies* and the South African publication, *Flypaper*, have reprinted our acrobatic rules.

Of interest to many record conscious modelers is the proposal of the *International Commission for Model Airplanes* that data from the material which accompanies requests for recognition of International and World Records be made available. At the present time, this information is filed. The Commission favors starting a publication which would give details of record holders, international contests, etc.

1951 Nationals. As this is written, the site for the *1951 Nationals* is being considered by the sponsoring, cooperating, and sanctioning bodies, the *National Exchange Club*, the *United States Navy*, and the *Academy of Model Aeronautics*. The Navy has prepared a list of available Navy Bases and a definite location will be forthcoming soon.

Under consideration for future Nationals is a long range program that would move the Nationals from place-to-place all over the country with locations being announced years in advance. For instance, one year the Nationals might be held in California, the next in Illinois, the next in Pennsylvania, etc. Exponents of this idea feel that it would be an excellent way of affording more model builders an opportunity to attend a Nationals.

Recent Records. A familiar name in West Coast speed circles is that of Mark Brown, Stockton, California, who set the Senior Class D Controline Speed Record of 149.94 mph last September 24th. Mark's design seems to be typical of several recent California designs. That is, it appears to have a conventional helmet cowl, sheet aluminum wings, and a turned mahogany fuselage. His model, weighing 27.5 oz., had a wing span of 16", overall fuselage length of

17.5", and was powered by a series *20 McCoy 60* and *9D x 12P Tornado* prop.

Harold deBolt of Williamsville, N. Y. has been upping the Class A Open Controline Speed Record right along this year with his latest effort being 120.27 mph on October 1, 1950. His model, a *Speedwagon 20* weighing 9 oz., was powered by a *McCoy 19* using a *7D x 9P Power Prop* which was cleaned up and thinned out.

Down Texas way, Don Steele of Lubbock established the National Class C Open R.O.W. Free Flight Gas Record of 18:15.6 last October 22nd. His *Spitfire* powered *Civy Boy 84* weighed 80 oz. Anyone who has flown ROW models know Don's flights represent quite a record, since the addition of floats with their added drag and weight really cut down on performance usually.

Main ingredients for setting records are that your model be flown in an AMA Sanctioned Contest or Record Trials in which there are 10 or more contestants who have presented models for processing, conducted under the regulations of the *Academy of Model Aeronautics*. Now that you know where to fly, the next step should be what to fly. This little item, if you were interested in all model categories, could and does fill an entire book. So, we won't try to go into that, but suggest your sending AMA 4¢ in stamps to cover mailing costs and request that a copy of the *Official Model Aircraft Regulations* be sent to you. Now you ask, "why must I fly in an AMA Sanctioned event to set a record?" The answer is relatively simple when you realize that this is the only way that will assure the model being flown and timed in accordance with the AMA rules since an officially appointed Contest Director, when applying for his license, pledges that he will impartially administer the Official AMA Regulations at all meets in which he officiates. The presence of 10 flyers is a double check that the Official Regulations are followed, since a protest by any one of the 10 can nullify a request for recognition of a record.

Available From AMA. In case the previous announcement of model airplane insurance may have slipped by you, this is to let you know that insurance protection which is available to AMA license holders at a reasonable rate, and which will afford broad protection in covering your financial investment in model airplanes, engines, and equipment is still available.

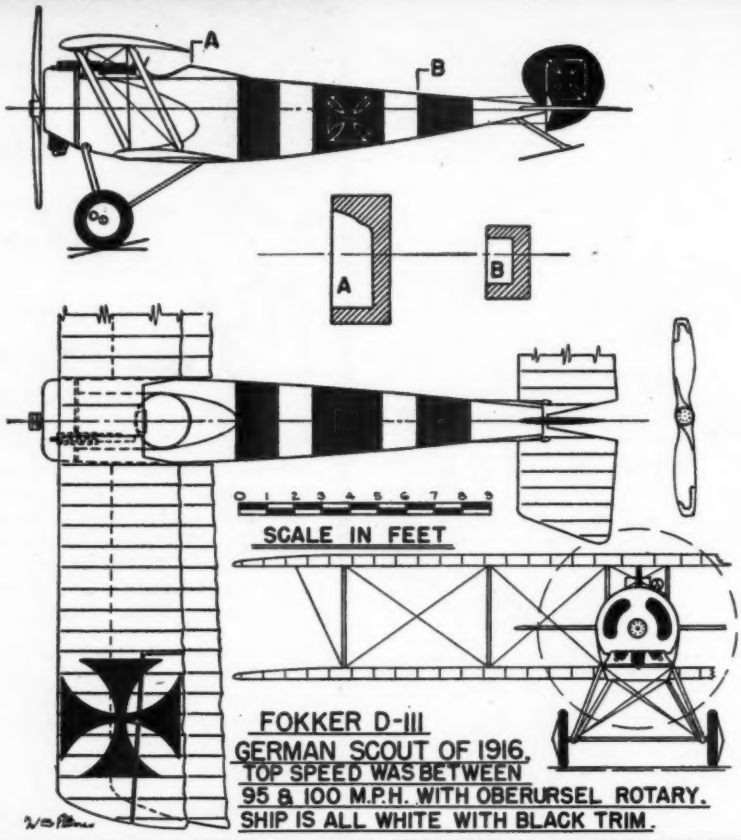
The insurance covers the perils of fire, lightning, earthquake, explosion, windstorm, flood, collision, the overturning of conveyances, together with the theft of an entire model or engine, and damage by the general public to your model, other than malicious mischief. Crack-ups, of course, are not covered.

Tools and equipment are also covered, where requested, subject to $5.00 deductible per loss. The chief exclusions in the policy are wear and tear, riot, civil commotion, war, or property while being conveyed on bicycles, motorcycles, motor scooters or aircraft other than commercially operated airlines.

At the request of many model builders, AMA Headquarters made arrangements with an insurance company to make this policy available to you. This has been done purely as a service to the modelers and AMA has no interest other than that of helping you get the best possible protection at the lowest possible premium. To obtain exact cost and application, just drop a note to AMA Headquarters.

Is club interest lagging? If so, a movie may be just what you need to pep up a meeting. There are several good ones available, one being the 16 mm. sound film on the *Third International Model Plane Contest* entitled *Wings Over the World*. A film of this type could very well fill an enjoyable half-hour of a meeting and, if one of the members was a contestant in the meet, he could easily fill in extra details of his trip to Detroit that would be of general interest, especially to members who plan on competing for the trip this year.

Wings Over the World can be obtained from several sources. Probably the best and most convenient to you would be from your local Plymouth Dealer. Should he



FOKKER D-III
GERMAN SCOUT OF 1916, TOP SPEED WAS BETWEEN 95 & 100 M.P.H. WITH OBERURSEL ROTARY. SHIP IS ALL WHITE WITH BLACK TRIM.

not have the film and is unable to get it, write the Academy. AMA has several copies of this film which are loaned to clubs at no charge except for shipping. Only requirements for using the film are that the film be handled with care; no admission is charged at the showing; it be returned promptly; and above all, that no attempt is made at showing the picture on a silent film projector.

Other films are available from AMA too. AMA has Plymouth films on the 1st and 2nd Internationals and Pan American World Airways films on the 1949 Nationals held at Olathe, Kansas. All these films are sound and 16 mm. The PAA film is of special interest since it covers practically all phases of model flying. If you want to use the AMA films on the 1st Internationals, 2nd Internationals, or 1949 Nationals, you'll have to put your request in well in advance of your planned showing date. The demand for these films has proven to be so great that we just don't have enough films to meet the demands all the time.

Brewer Trophy. The Frank G. Brewer Trophy, first awarded in 1943 "For the most outstanding contribution to the development of air youth in the field of education and training," was awarded last December 16th, for the first time to a prominent figure in the model aviation field. Recipient of the award was Lt. John H. Burton, USN. Lt. Burton, head of the Youth and Education Branch of the Secretary of the Navy's Office of Information, has been active in formulating and implementing plans and policies of the Youth and Education Branch. In addition to formulating the Navy's rules for the Controline Carrier Event and Radio-Controlled Bomb Dropping Event, he executes Secretary Matthew's broad policies affecting youth and education. Many of you have probably seen him at the Dallas *Nationals* and 1950 *Internationals* directing the Navy's events.

It seems of prime importance that the Brewer Trophy Committee has recognized in model aviation, and particularly in Lt. Burton, the extremely effective means of educating youth in aviation by doing in-

stead of reading. For some time many individuals in the Navy Department have agreed that the fate of our country depends on the education of youth. Rear Admiral Richard F. Whitehead said, "The future of American Aviation will largely depend upon the continued enthusiasm and know-how that these young men acquire in the construction of their models."

Late Bulletins. By the time this is read, all 1951 rules questionnaires which were sent to Contest Board Members will have been received. Changes affecting 1951 rules will be carried in this column in the near future. Harold Bunting, your 1950 AMA Contest Board Chairman, prepared, reproduced, and mailed the three-page questionnaire in order to relieve Headquarters of all possible detail. He has done an outstanding job and appreciates your cooperation and assistance.

As this was being written, only a few days remained in which to vote for national and regional AMA officers. Election returns had been very slow. If voting continued as it was, the entire officers would have been elected with a total vote of under 5% of the AMA license holders. Considering the importance of this election to the modeler and the fact that over 10,000 ballots were sent out, this percentage seems entirely too low. Next year, when election time comes, think—remember, your vote has a great deal to do with AMA policies and the regulations under which you fly.

READERS
NAME YOUR PREFERENCE

Every reader of MODEL AIRPLANE NEWS has his own ideas of what should be featured in the magazine. However, few of you ever let *us* know, so we simply have to guess what will interest the majority of M.A.N. readers. Here's your chance to speak out—just mark your preferences below, clip out this ballot (or copy on another sheet), and rush it to our Editorial Office, at 551 Fifth Avenue, New York 17, N.Y.

1. (a) Do you like full size plane cover paintings, as on this issue?.....
   (b) Or, do you prefer model plane subjects on the cover?.....

2. Write (1) after feature you like best, (2) for the next, etc. *Cross out* those of no interest.
   (a) The 1950 Wakefield Winner .....
   (b) Caper Cutter .....
   (c) Team X A/2=FUN .....
   (d) Try Flying Wings .....
   (e) Something New In Payload .....
   (f) Design Details .....
   (g) Lockheed F-90 .....
   (h) Engine Review .....
   (i) Three Views .....
   (j) The DH-5 .....
   (k) Scrap Box .....
   (l) Air Ways .....
   (m) Official AMA News .....
   (n) Report from The West .....
   (o) Model Kinx .....
   (p) Cartoon Strips .....
   (q) News of Modelers .....

3. What would you have liked us to print in this issue that we didn't include?

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Try Flying Wings

(*Continued from page* 13)

out on a swept wing makes the wing look aerodynamically like an unwarped wing. (If a swept wing were perfectly flat, the wing tip would actually be flying at a higher angle of attack than the root which is the opposite of what is desired.) Additional washout is then incorporated for stability. The *Gull* had a total of 7-1/2° washout. An effect similar to washout may be obtained by constructing an unwarped wing and then making a wing break such that the outer (rear) portion of the wing has less incidence than does the inner (forward) portion. Another example of a stable wing configuration is a swept forward plane with washin; still another example is a swept back craft with the airfoil on the outer portion of the wing being inverted.

It was found extremely difficult to employ a pop-up tail as a dethermalizer on a craft of this type due to the lack of a tail to pop up. A Kleenex parachute which was housed between two ribs was therefore used to fulfill this purpose. However, the chute which opened, except when the shroud lines fouled it, did not always remain open as it would rotate thus twisting the shroud lines, and finally the chute would close and stay closed. To cure both evils a light wire frame about 2" square and about 1" from the chute was used to keep the four shroud lines apart. Since incorporating this frame, there have been no chute failures.

The covering on all the Flying Wings built was doped with plasticized dope. The small amount of effort required to add castor oil to the dope will repay itself many times over on any type of model. This helps remove the excessive pulling tendencies in dope that is the cause of many a warped model. Add as much castor oil as possible without causing the dope to be non-drying.

The information presented in this article should be an excellent guide to both novice and expert in the designing of Flying Wings. The consistent results shown by the author's Flying Wings in contests prove that this type of craft is capable of contest winning performance. There are many combinations, configurations and ideas that have yet to be exploited, so how about it fellows, let's design Flying Wings!

The 1950 Wakefield Winner

(*Continued from page* 10)

placed under the upper balsa planking preventing it from breaking inwards. The trailing edge has been reinforced with .4 mm. ply (about .016") so that the rubber strips would not break it.

A special feature is a turbulator strip on the leading edge of the wing about which there has been much talk. It is 1/32" sq. in size and is cemented on the leading edge so that its foremost margin is in the same vertical position as the leading edge.

The fin and stabilizer require no comment. The upper part of the rudder is cemented together with the stabilizer, and the lower part with the fuselage. The airfoil section of the stabilizer is a thinned down *Clark* Y (10%). The stabilizer has end plates as on the previous model. The main spar is lightened by cutting off a triangular piece from both ends.

The landing gear is of orthodox construction and made of piano wire. The main supports are 1.25 mm. (.049) and 1 mm. (.039) wire, and the middle support of .25 mm. (.01) wire. The wheels are of 1 mm. (about 1/25") ply. There is a hole in the center of them and a short length of brass tube fits into this hole. A tubular rivet has been forced into the bearing tube at both sides of the wheel. In this way, the bearing tube has been fastened to the wheel.

The nose block is formed on 1 mm. (about 1/25") ply on which a round piece of 4 mm. (about 5/32") ply is cemented. This piece fits into the nose opening of the fuselage, keeping the noseblock in its position. The bearing for the propeller shaft is made of brass, and it is fastened to the nose block in the same way as the bearing tube to the wheel.

The prop shaft is of 2 mm. (.078) wire on which a radial pin is soldered. This pin engages the clutch of the freewheel. The pin is the 20 mm. (about 4/5") long free-end of a wire spiral which has been made by bending 1.25 mm. (.049) wire around another of 1.75 mm. (.063) diameter several tight turns and in such a direction that the freewheel-clutch tightens the spiral when the motor is wound. The back end of the spiral is filed flat, and it functions as shoulder plate for the ball bearing.

The prop is a theoretical one in the view of its pitch. I mean the pitch is equal from the center to the tip, 62 c. (24.4"), giving a pitch/diameter ratio of 1.38. The diameter is 45 c. (17.71"). The prop blade is 52 mm. (about 2") wide at 40 mm. (1.57") from the tip.

The prop bearing is made of a brass tube with soldered end plates which are fitted with small barbs. The barbs droop into the wood and keep the bearing tube firmly in its place. The end plate at the back of the spinner has a shaft on which a short length of brass tube is soldered for the freewheel.

The *cracs* have been named according to the distinctive noise of the gears. It is a gadget which transmits the turns of one motor to the other and is placed in the rear part of the fuselage. Compared with my last year's model, this up-to-date construction is considerably better. The frame is made of a thin steel tube. It is fitted with holes for the shafts and with *wings* on the upper end. These *wings* prevent the *cracs* from turning when the unit is placed on the frame.

The gears are made of brass and are 20 mm. (.787") in diameter and 2 mm. (.079) in thickness. They are turned down in the middle to about .4 mm. (.016) and besides that there are lightening holes. The shafts are of 1.5 mm. (.059") piano wire. There are no ballbearings but the center part of the gear works as a shoulder bearing.

Each motor's original length is 75 c. (29.5") but the elasticity of the rubber causes them to stretch after winding the total amount of turns to the same space between the hooks, which is 82 c. (32.28"). One motor includes 14 strands of 1/24" x 1/4" *Dunlop* rubber. I wind it 600 turns; the total number of turns used in both motors at the contest was 1200.

The adjustment is carried out by setting the wing at 6° and the stabilizer at 3° positive. Furthermore, the prop has a right-hand thrust in order to eliminate torque and giving, with the fin, a right-hand turn from start to landing. Also a downthrust of 2° was used but, viewing this and the difference between the angle of incidence of the mainplane and stabilizer, the adjustment was not completed. Due to the angles of incidence the center of gravity is situated 75% from the leading edge.

Although I had difficulties adjusting this model, I can say it is easy to fly in its present shape. I am completely satisfied with the results and performance. In spite of the fact there will be some radical alterations in the rules next year, I shall stick to my present line by planning the next model for the coming year's contest which probably will be held in Finland again. All of us Finnish modelers wish sincerely that the Americans would also have an opportunity to come personally to protect their traditions of winning the Wakefield Cup. Hope to see you in 1951!

Team × A/2 = Fun

(*Continued from page* 21)

in one piece from tip to tip with no dihedral. We took the easy way out and cut the wing from 3" glider wing semi-finished stock. This saves much time and bother and produces a most accurate airfoil almost without effort. Sand the wing smooth rounding off the tips and then cement the wing securely to the fuselage bottom. Fillet this joint with several coats of *Testors Formula B* cement. The cheek cowls are now added. These can be cut from standard transparent bubble canopies obtainable at most hobby shops. Cut off about 3/8" from the front and 5/8" from the rear, depending on the shape of the original canopy, and then trim the edges carefully to fit the nose and engine. Before attaching

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these cowls several coats of fuel proofer should be applied to the inside.

We found that two coats of wood filler produced a decent finish; however many more are required to achieve a high lustrous gloss. Three coats of colored dope were used. Our model is white with black trim. All trimming was done with *Trim-Film*. Be sure to sand the model with fine sandpaper between each coat of wood filler and dope. Install the pilot and add the cockpit enclosure. The tailskid and control line guides on the inboard wing tip are now installed thus preparing the model for its two coats of clear fuel proofer. Make certain the nose interior is fuel proofed also.

Before attempting to fly your handiwork make sure that it balances at the point indicated on the plans. A slight amount of solder or lead shot securely attached to the nose or tail can correct any unbalanced condition. This size model can be flown on heavy carpet thread or fine fish line, heavily waxed, and a 25′ radius circle seems perfect. Our model used a 5-1/2″ dia., 5″ pitch *Power Prop* and a 5-1/2″ dia. *Cub Prop* with equal success. Spinner is a Rev-Up 1″ aluminum type and *O.K. Glow Fuel* was used during tests. Fly with care and be sure to check those fabric lines for worn spots for the safety of both model and spectators.

Something New in Payload

(*Continued from page* 33)

on the cabin here. The spars are eliminated in the 1/2A; however, they are a must in the A. Use 3/16″ square for spars. Silkspan or silk will be best on the A, and a few extra coats of dope also will be wise. A 10″ x 3-1/2″ or 10″ x 14″ propeller will work well here, and to get maximum performance, be sure that the blades are thin.

Atlas is not adaptable to the new *Cargo* event being sponsored by *Pan American* this year. (Complete details of this new event are described in the AMA News section.) Intended to carry a maximum payload for an official flight, or 40 sec. minimum duration, these weight lifters will be nothing like the current A/2 free flights, or even like the *Atlas* payload job. My new weight lifter has 400 sq. in. of area and continues to glide well with weights of 6 to 8 oz., indicating that still more load may be carried. When carrying an 8 oz. load, the experimental airplane has taken off within 12′ indoors. With the benefit of any breeze, it will jump off much sooner when flown outdoors.

It may be well to mention here that the prizes in the various payload meets are fine and worth trying for, remembering that here in free flight, you don't have to be a so-called expert to bring home the bacon!

News of Modelers

PEN-PAL SEEKERS: Joe A. Lyall, 14471876, Black Watch (R.H.R.), Prospect Barracks, Bermuda has been an avid model builder for years and would like to write to a few model builders from this country. He is interested in all classes of model building. Joe would also like to exchange a brand new 2 cc. *E. D. Competition Special Diesel* for a corresponding *Dooling 29* or a *Fox 29* Racing Special . . . Pedro Ramos Garcia, San Miguel de Los Banos, Province Matanzas, Cuba is desirous of writing to someone interested in U-control stunt and scale jobs . . . If anyone is interested in obtaining an *O & R 60*, brand new, and would be willing to exchange it for an *Arden .199*, write to Bruce Beadell, 311 E. Water St., Austin, Minnesota. Bruce is also interested in obtaining a pen-pal . . . Antonio Lopez Quiles, Generalisimo No. 2, Catarroja Valencia, Spain wishes to correspond with a modeler who can write Spanish . . . Thomas Black, 20 Davidson Avenue, Glengarnock, Ayrshire, Scotland is anxious to correspond with an American his own age (18) with a view to exchanging magazines, plans, etc. . .

EXCHANGE MOTORS: Guido Battistella, Via Nam 36. Lido Venice, Italy has a *Supertigre 15* Diesel engine 5 cc. in perfect condition which he would like to exchange for an *Ohlsson* glo plug engine.

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